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CONTENTS

	Page
The Genus <i>Pseuduvaria</i> Miq. (Annonaceae) in Australia L.W. Jessup	307
<i>Racosperma deltoideum</i> (Cunn. ex G.Don) Pedley (Leguminosae: Mimosoideae) and related species in northern Australia L. Pedley	314
Notes on <i>Racosperma</i> Martius (Leguminosae: Mimosoideae), 1 L. Pedley	321
Notes on Sapindaceae, V S.T. Reynolds	328
Two new species of <i>Notelaea</i> Vent. (Oleaceae) from south-eastern Queensland G.P. Guymer	339
<i>Racosperma</i> Martius (Leguminosae: Mimosoideae) in Queensland: a checklist L. Pedley	344
<i>Racosperma</i> Martius (Leguminosae: Mimosoideae) in New Zealand: a checklist L. Pedley	358
Rediscovery and status of <i>Adiantum whitei</i> Bailey (Adiantaceae) P.D. Bostock	360
Revision of the Australian Vitaceae, 2. <i>Cayratia</i> Juss. B.R. Jackes	365
Annotated checklist of Queensland Hepaticae J. Windolf	380
Studies on the Australian Asclepiadaceae, II. A new combination in <i>Gymnema</i> R.Br. P.I. Forster	401
Three new species of <i>Bonamia</i> Thouars (Convolvulaceae) from Central Australia R.W. Johnson	405
Two new species of <i>Convolvulus</i> L. (Convolvulaceae) from South Australia R.W. Johnson	408
A new species of <i>Isotropis</i> Benth. and a new record of <i>Daviesia</i> Smith (Fabaceae: Mirbelieae) from Queensland M.D. Crisp	412
NOTES	
<i>Paramignya</i> Wight (Rutaceae: Citreae) in Australia L. Pedley	416
Book Review	417
Corrigendum	418

THE GENUS *PSEUDUVARIA* MIQ. (ANNONACEAE) IN AUSTRALIA

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Summary

Three new species and one new variety in *Pseuduvaria* Miq. from north-eastern Queensland are described. They are *P. hylandii*, *P. villosa*, *P. mulgraveana* var. *mulgraveana* and *P. mulgraveana* var. *glabrescens*.

The palaeotropical genus *Pseuduvaria* currently with about 35 species was first proposed by Miquel (1858) but remained in obscurity following inclusion in *Mitrephora* by Bentham and Hooker (1862) until Merrill (1915) proposed its recognition and made several new combinations. Sinclair (1955, 1956) and others accepted Merrill's viewpoint and published additional species.

In Australia, Mueller (1887) followed the Bentham and Hooker concept when describing *Mitrephora froggattii* F.Muell. from Queensland. This species was transferred to *Pseuduvaria* by Jessup (1986). Three new species and one new variety, all from north-eastern Queensland, are here described.

Living plants of all species were studied. Floral and fruit measurements provided were taken from material preserved in spirit.

PSEUDUVARIA

***Pseuduvaria* Miquel, Fl. Ind. Bat. 1(2): 32 (1858). Type: *Pseuduvaria reticulata* (Blume) Miquel based on *Uvaria reticulata* Blume.**

Dioecious shrubs or trees. Leaves with slightly curved, $\pm$ parallel secondary veins; tertiary venation scalariform-reticulate. Flowers cauline, ramal, axillary or sometimes terminal, solitary or several, sometimes many in fascicles. Pedicels slender, slightly tapering, thickened towards the flower; bracts 2, basal and submedial or suprabasal; articulation between the bracts. Calyx lobes 3, valvate. Petals 6, in 2 series, valvate; outer 3 larger than calyx lobes, spreading or reflexed; inner 3 larger than outer, each with a trullate, broadly rhombic or obtrullate blade and a narrow claw; blade margins coherent forming a trifenestrate dome-like cap; blades with 2 raised glands on inner surface; claw shorter than blade. Torus rounded, pilose. Male flowers: stamens *ca* 60, truncate-cuneate; connective flat-topped, concealing anthers. Female flowers: staminodes usually 6-18. Ovaries numerous, the peripheral ones incurved; ovules few, superposed; stigma sessile, depressed capitate with an adaxial radial slit. Ripe monocarps sessile in Australian species. Seeds 1-several, transverse ellipsoid with a circumferential groove.

Distribution: The genus is distributed through Burma, Indo-China and Malesia to Papua New Guinea and Australia.

Key to Species

1. Pedicels 7-25(-32) mm long; submedial bract 1.2-3 mm long. Testa rugose 2
- Pedicels 30-50 mm long; submedial bract 0.5-1 mm long. Testa scrobiculate 3
2. Flowers in cauline many-flowered fascicles as well as ramal and axillary; pedicels 15-25(-32) mm long. Glands on inner petals prominently raised, discrete 1. *P. froggattii*
- Flowers ramal and axillary, solitary or up to 4 per fascicle; pedicels 7-11 mm long. Glands on inner petals slightly raised, contiguous 2. *P. hylandii*

3. Calyx lobes broadly ovate to depressed ovate, 1.5–2.2 mm long. Outer petals obovate, suborbicular or depressed obovate, obtuse or very shortly acuminate, 6–8 mm × 6–8 mm. Leaf undersurface and petiole hirtellous, glabrescent 3. *P. mulgraveana*

Calyx lobes ovate or triangular, 2.5–4 mm long. Outer petals broadly ovate, acute or acuminate, 10–15 mm × 8–10 mm. Leaf undersurface and petiole villous 4. *P. villosa*

1. *Pseuduvaria froggattii* (F.Muell.) Jessup, *Austrobaileya* 2(3): 227 (1986).

Mitrephora froggattii F.Muell., *Australas. J. Pharm.* 2: 3 (1887). **Syntypes:** Mossman River, Qld., in 1886, *W.Sayer* 145 MEL 670807, *W.Sayer* 145 & *W.Froggatt* MEL 670808, *W. Sayer* MEL 670809 (all MEL).

Tree to 8 m high and 15 cm d.b.h. Innovations pubescent, glabrescent. Leaves elliptic to lanceolate, acuminate, glabrous. Lamina 10–20(–30) cm × 3–7(–9) cm; base obtuse or rounded, rarely acute; midvein sunken above, raised below; secondary veins mostly 7–10 pairs. Petiole grooved above, 4–10 mm long, glabrous. Inflorescence cauline, ramal or axillary in males, cauline or ramal in females; many-flowered fascicles if cauline or ramal, or flowers solitary or few if axillary. Flowers ± pendulous; pedicels 15–32 mm long, puberulent; submedial bract 1.2–2 mm long. Calyx lobes broadly ovate or suborbicular, obtuse or shortly acuminate, 2–3 mm long, puberulent outside, glabrous inside. Outer petals spreading, broadly obovate to suborbicular, obtuse or rounded, 9–9.5 mm × 7.5–8 mm, puberulent, glabrescent outside, glabrous inside. Inner petals puberulent outside, glabrous inside; dome 8.5–12 mm long and 9–12 mm diameter; blades 7–12 mm wide; glands prominently raised, discrete. Male flowers: stamens 0.6–1.1 mm × 0.7–0.8 mm. Female flowers: ovaries *ca* 38, pilose; ovules 2 or 3. Ripe monocarps obovoid-ellipsoid or ovoid, 15–20 mm long, puberulent, orange-yellow. Seeds 1 or 2; testa rugose, brown. **Fig. 1.**

Specimens examined. Queensland. COOK DISTRICT: Pilgrim Sands, NW of Cape Tribulation, 16°04'S, 145°27'E, Nov 1984, *Jessup* 611 (BRI,K,L,MEL,MO), 612 (BRI,K,L,MO,QRS,U), Sep 1980, *McKenzie* (BRI); Oliver Creek, 16°06'S, 145°27'E, May 1972, *Webb & Tracey* 11590 (BRI); 16°08'S, 145°27'E, Oct 1979, *Gray* 1540 (BRI,QRS); 16°00'S, 145°25'E, Oct 1975, *Hyland* 3337 R.F.K. (BRI,QRS); Portion 62 Alexandra, 16°10'S, 145°25'E, Dec 1972, *Hyland* 6611 (BRI,QRS), Dec 1973, *Hyland* 7173 (BRI,QRS), Oct 1975, *Hyland* 8481, 8482 (BRI,QRS); Stewart Creek, Upper Daintree, 16°2–'S, 145°1–'E, Jan 1983, *Sankowsky* 248, 249 & *Sankowsky* (BRI); Intake, Mossman, 16°27'S, 145°22'E, Sep 1948, *Smith* 3968 (BRI); Mossman Gorge, Oct 1964, *Schodde* 4162 (BRI); Mossman River near entrance to Mossman Gorge National Park, 16°28'S, 145°21'E, Dec 1982, *Jessup* 543 (BRI,U), 546 (BRI,MEL), 547 (BRI,NSW), 548 (BRI,CANB); near lookout beside road from Julatten to Mossman, 16°33'S, 145°24'E, Dec 1982, *Jessup* 542 (BRI).

Distribution and Habitat: This species is recorded from north of Cape Tribulation to just south of Mossman, in northern Queensland and occurs as a subcanopy tree in mesophyll vine forest on lowlands and foothills on colluvia and metamorphics.

2. *Pseuduvaria hylandii* Jessup, *sp. nov.*

Arbor usque 13 m alta. Folia lanceolata vel elliptica, interdum oblanceolata, acuminate vel acuta, glabra. Lamina 6–15(–20) cm longa et 2–6 cm lata; basi acuta interdum obtusa. Petiolus 4–5 mm longus. Inflorescentia ramala, axillaris vel terminalis; flores solitari vel in fasciculis usque 4. Pedicelli 7–11 mm longi, puberulenti; bractea submedia 2–3 mm longa, subamplectens. Lobi calycis depressi ovati breviter acuminati, exter puberulenti intra glabri. Petala exteriora late depressa ovata vel suborbicularia obtusa vel rotundata, 5.5–6 mm longa et 6–7 mm lata, exter pubescentia intra glabra. Petala interiora exter velutinosa intra glabra; tholus 9.5–14 mm longus et 8–10 mm diametro; laminae 6.5–8 mm latae. Flores masculi: stamina 0.7–1 mm longa et 0.6–0.8 mm lata. Flores feminei: ovaria circa 28, pilosa; ovula 2. Monocarpia matura obovoidea vel subglobularia, 17–23 mm longa, puberulenta glabrescentia, armeniaca. Semina 1–2; testa rugosa, brunnea. **Typus:** Timber Reserve 1230, Boonjee Logging Area, 17°22'S, 145°44'E, 6 Oct 1977, *B.Gray* 731 (male) (holo: BRI; iso: QRS).

Tree to 13 m high and 30 cm d.b.h. Innovations puberulent, glabrescent. Leaves lanceolate or elliptic, sometimes oblanceolate, acuminate or acute, glabrous. Lamina 6–15(–20) cm × 2–6 cm; base acute, sometimes obtuse; midvein sunken above, raised below; secondary veins mostly 7–10 pairs. Petiole ± channeled above, 4–15 mm long, glabrous. Inflorescence ramal, axillary or terminal; flowers solitary or in fascicles of up to 4. Pedicels 7–11 mm

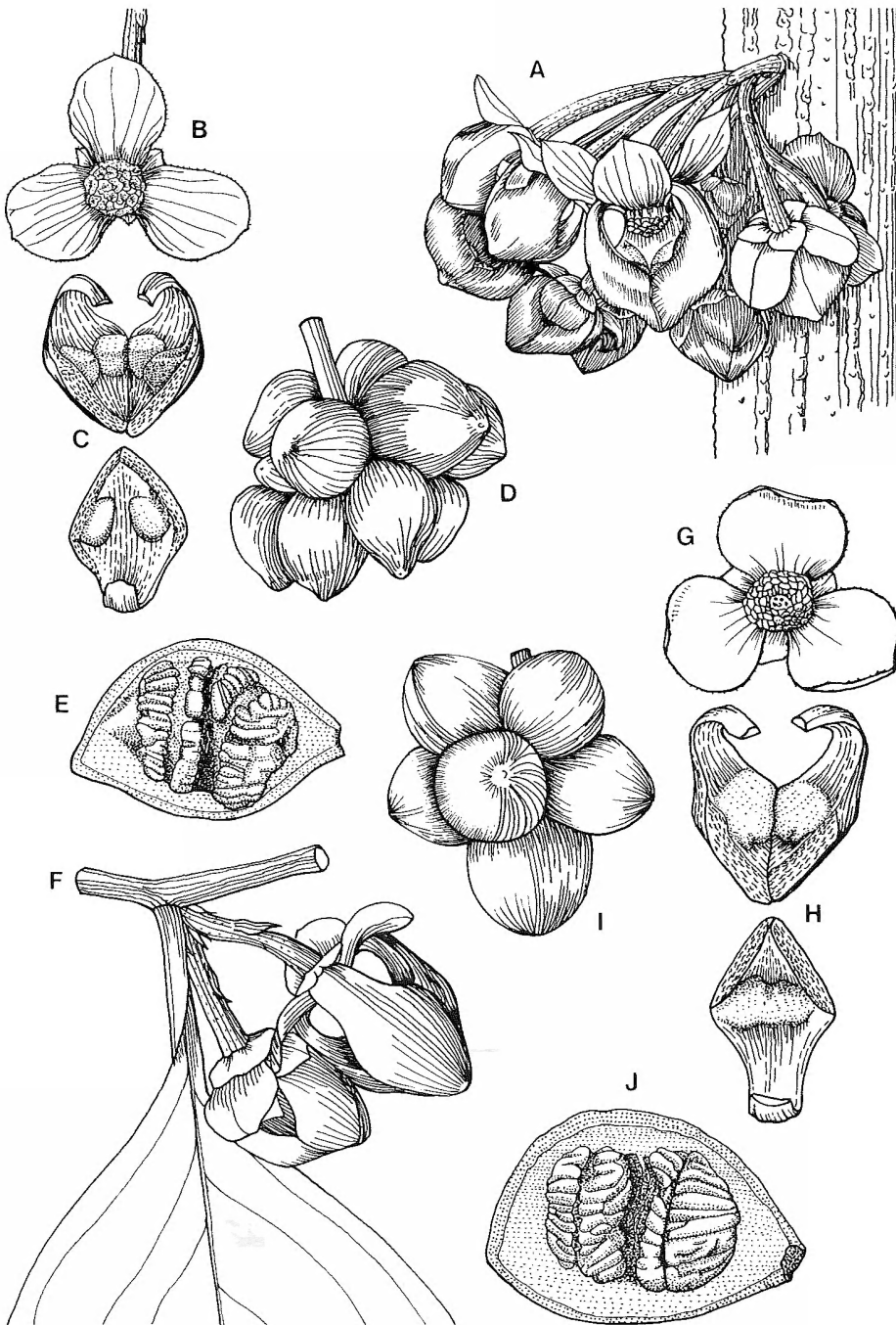


Fig. 1. *Pseuduvaria froggattii*: A. cauline inflorescence (Jessup 546) $\times 2$. B. female flower with inner petals removed (Jessup 546) $\times 2$. C. inner petals (Jessup 546) $\times 2$. D. fruit (Jessup 612) $\times 1$. E. L.S. monocarp with 2 seeds (Sankowsky 248) $\times 1$. *P. hylandii*: F. inflorescence (Gray 731) $\times 2$. G. male flower with inner petals removed (Gray 731) $\times 2$. H. inner petals (Gray 731) $\times 2$. I. fruit (Hyland 7192) $\times 1$. J. L.S. monocarp with 2 seeds (Hyland 7192) $\times 1$.

long, puberulent; submedial bract 2–3 mm long, semi-clasping. Calyx lobes depressed ovate, shortly acuminate, 2–3.5 mm long, puberulent outside glabrous inside. Outer petals broadly or depressed ovate or suborbicular, obtuse or rounded, 5.5–6 mm × 6–7 mm, pubescent outside, glabrous inside. Inner petals velutinous outside, glabrous inside; dome 9.5–14 mm long and 8–10 mm diameter; blades 6.5–8 mm wide; glands slightly raised, contiguous. Male flowers: stamens 0.7–1 mm × 0.6–0.8 mm. Female flowers: ovaries *ca* 28, pilose; ovules 2. Ripe monocarps obovoid or subglobular, 17–23 mm long, puberulent, glabrescent, orange-yellow. Seeds 1 or 2; testa rugose, brown. **Fig. 1.**

Specimens examined. Queensland. COOK DISTRICT: State Forest Reserve 310, Swipers Logging Area, 17°15'S, 145°45'E, Oct 1968, *Hyland* 1986 R.F.K. (BRI); West Mulgrave River, 17°20'S, 145°47'E, Nov 1982, *Jessup* 536 (BRI,K,QRS,U); Timber Reserve 1230, Boonjee Logging Area, 17°22'S, 145°44'E, Oct 1977, *Gray* 731 (BRI,QRS); 17°24'S, 145°45'E, Sep 1976, *Hyland* 3443 R.F.K. (BRI,QRS); 17°25'S, 145°45'E, Oct 1973, *Hyland* 2914 R.F.K. (BRI,QRS); Dec 1973, *Hyland* 7155 (BRI,QRS); Feb 1974, *Hyland* 7192 (BRI,QRS).

Distribution and Habitat: This species is known to occur only in the upper catchments of the Mulgrave and Russell Rivers, in northern Queensland and occurs in mesophyll vine forest on soils derived from metamorphics, sometimes basalt enriched.

Affinities: *P. hylandii* appears most closely related to *P. froggattii* and differs by being not cauliflorous, by shorter pedicels, larger floral bract, smaller petals, and inner petal glands being only slightly raised and contiguous.

Etymology: The species is named in honour of Mr. B.P.M. Hyland of Atherton who collected the first specimens in 1968.

3. *Pseuduvaria mulgraveana* Jessup, sp. nov.

Arbor usque 7 m alta. Folia lanceolata oblanceolata obovata vel raro elliptica, acuminata vel interdum acuta, supra glabra vel hirtella infra glabrescentia. Lamina 5–16 cm longa et 2–7 cm lata; basi rotundata interdum parum cordata et asymmetrica. Petiolus 2–4 mm longus, hirtellus. Flores axillares, terminales vel superi ramali, pendentes solitari vel increbre 2 vel 3 invicem maturantes. Pedicellii 30–40 cm longi, puberulenti; bractea submedia 0.5–1 mm longa. Lobi calycis late ovati ad depressi ovati, obtusi acuti vel breviter acuminati, 1.5–2.2 mm longi, exter puberulenti intra glabri. Petala exteriora obovata suborbicularia vel depressa obovata, obtusa vel breviter acuminata, 6–8 mm longa et 6–8 mm lata, exter puberulenta intra glabra. Petala interiora exter puberulenta intra glabra; tholus 10–14 mm longus et 10.5–13 mm diametro; laminae 10–12 mm latae. Flores masculi: stamina 1.1–1.3 mm longa et 0.8–1 mm lata. Flores feminei: ovaria circa 28, pilosa; ovula 1 vel 2. Monocarpia matura obovoidea rotundata vel breviter acuta, 15–22 mm longa, puberulenta, armeniaca. Semina 1–2; testa scrobiculata, porphyrea. **Typus:** Queensland, Cook District: Goldsborough State Forest, Mulgrave River, 17°15'S, 145°46'S, 11 Dec 1984, *L.W.Jessup* 746 (male) (holo: BRI; iso: K,L,QRS).

Misapplied name: *Mitrephora froggattii* auct. non F.Muell.; B.P.M.Hyland, A Card Key to the Rainforest Trees of North Queensland. Department of Forestry, Queensland (1971); A Revised Card Key to the Rainforest Trees of North Queensland, CSIRO, Melbourne (1982); J.G.Tracey, The Vegetation of the Humid Tropical Region of North Queensland, CSIRO, Melbourne (1982).

Tree to 7 m tall and 10 cm d.b.h. Branchlets ± flexuose. Innovations puberulent or villous with light brown hairs. Leaves lanceolate, oblanceolate, obovate or rarely elliptic, acuminate or sometimes acute, glabrous or hirtellous above, sparsely hirtellous, glabrescent below. Lamina 5–16 cm × 2–7 cm; base rounded, sometimes slightly cordate and asymmetric, midvein sunken above, raised below; secondary veins mostly 7–10 pairs. Petiole nearly flat above, 2–4 mm long, hirtellous. Flowers axillary, terminal or upper ramal, pendulous, solitary or frequently 2 or 3 maturing successively. Pedicels 30–40 mm long, puberulent; submedial bract 0.5–1 mm long. Calyx lobes broadly ovate to depressed ovate, obtuse, acute or shortly acuminate, 1.5–2.2 mm long, puberulent outside, glabrous inside. Outer petals obovate, suborbicular or depressed obovate, obtuse or very shortly acuminate, 6–8 mm × 6–8 mm, puberulent outside, glabrous inside. Inner petals puberulent outside, glabrous inside; dome 10–14 mm long and 10.5–13 mm diameter; blades 10–12 mm wide. Male flowers: stamens 1.1–1.3 mm × 0.8–1 mm. Female flowers: ovaries *ca* 28, pilose; ovules 1 or 2. Ripe monocarps obovoid, rounded or shortly pointed, 15–22 mm long, puberulent, orange. Seeds 1 or 2; testa scrobiculate, red-brown. **Fig. 2.**

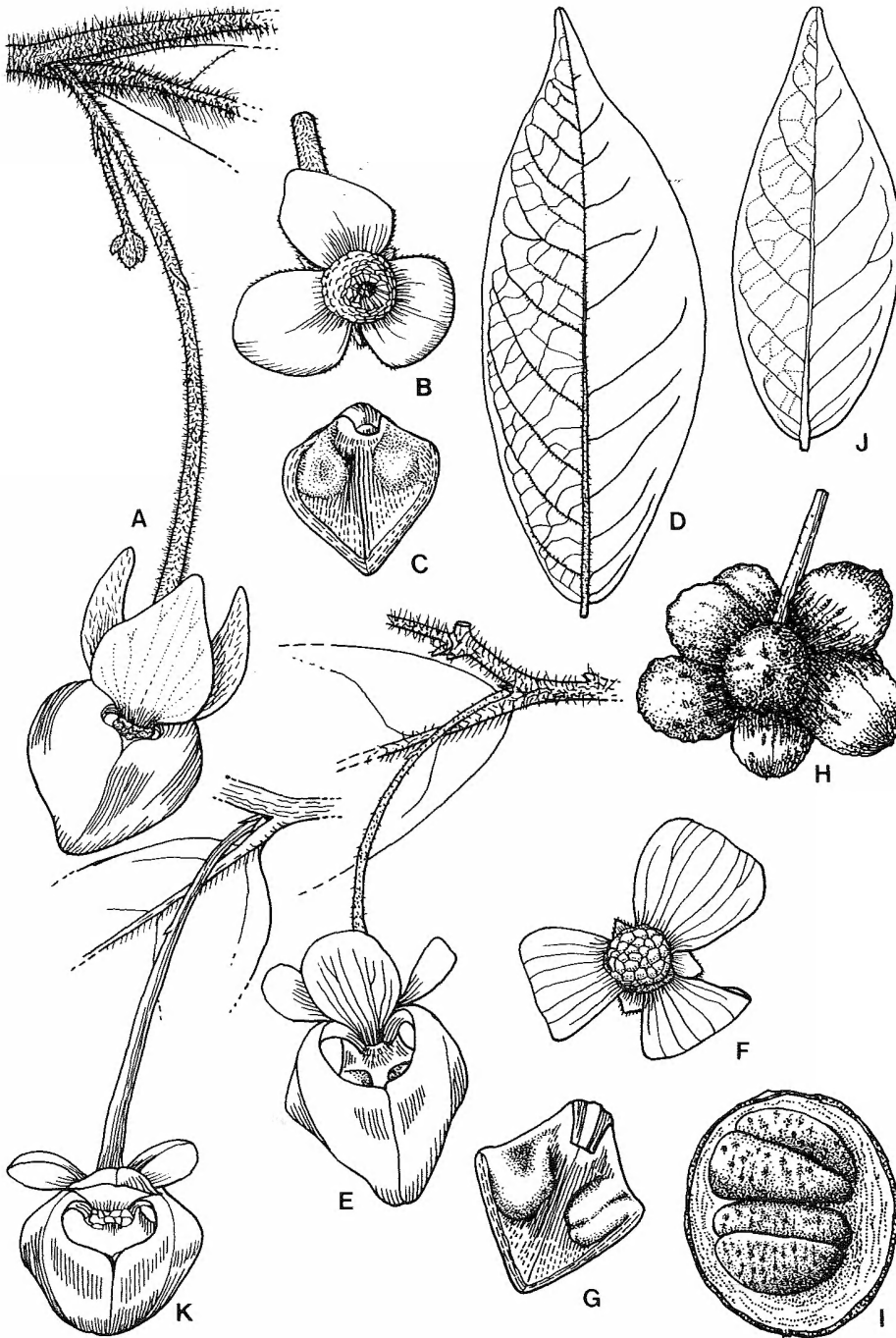


Fig. 2. *Pseuduvaria villosa*: A. flower (Jessup 472 & Tracey) $\times 2$. B. male flower with inner petals removed (Sankowsky 464) $\times 2$. C. single inner petal (Jessup 472 & Tracey) $\times 2$. D. leaf (Jessup 472 & Tracey) $\times 1/2$. *P. mulgraveana* var. *mulgraveana*: E. flower (Jessup 746) $\times 2$. F. female flower with inner petals removed (Jessup 604) $\times 2$. G. single inner petal (Jessup 604) $\times 2$. H. fruit (Sankowsky 356) $\times 1$. I. L.S. monocarp with 2 seeds (Sankowsky 356) $\times 1$. J. leaf (Jessup 604) $\times 1/2$. *P. mulgraveana* var. *glabrescens*: K. flower (Jessup 592) $\times 2$.

Two varieties are recognised

3a. *P. mulgraveana* var. *mulgraveana*

Branchlets and petioles hirtellous; lamina hirtellous on both surfaces, longer and more densely so along the veins on the lower surface.

Specimens examined. Queensland. COOK DISTRICT: Goldsborough State Forest, Mulgrave River, 17°13'S, 145°46'E, Feb 1982, *Jessup* 483 (BRI,L,QRS), 483A (BRI); 17°14'S, 145°46'E, Nov 1982, *Jessup* 534 (BRI), Nov 1984, *Jessup* 604 (BRI), 606 (BRI), 607 (BRI,CANB,K,L,MO,QRS); 17°14'S, 145°46'E, Dec 1984, *Jessup* 746 (BRI,K,L,QRS); National Park Reserve 226 (Harvey Creek), 17°15'S, 145°50'E, Jan 1972, *Hyland* 5787 (BRI,QRS); Harvey Creek, Mar 1922, *White* (BRI); without date or collector AQ210630 (BRI); Bellenden Ker, Jan 1923, *White* (BRI); Miriwnini, near Mt Bartle Frere, in 1962, *Webb & Tracey* 6680 (BRI).

Distribution and Habitat: This variety is found from the Mulgrave River to Miriwnini, northern Queensland and occurs on alluvial terraces and footslopes in mesophyll vine forest on soils derived from several mixed parent materials.

3b. *P. mulgraveana* var. *glabrescens* Jessup, var. nov. differt ab *P. mulgraveana* var. *mulgraveana* indumento ramulorum et petiolorum brevissimo sparso et laminis glabrescentibus. **Typus:** Queensland, Cook District: near Shoteel Creek, Clohesy River, 16°56'S, 145°36'E, 27 Nov 1984, *L.W. Jessup* 590 (female) (holo: BRI; iso: A,BRI,CANB,K,L,MEL,MO,NSW,QRS,U).

Distinguished from *P. mulgraveana* var. *mulgraveana* by the indumentum of the branchlets and petioles being very short and sparse and the glabrescent leaves.

Specimens examined. Queensland. COOK DISTRICT: Black Mountain road, N of Kuranda, Oct 1986, *Sankowsky* 546 (BRI); near Shoteel Creek, Clohesy River, 16°56'S, 145°36'E, Nov 1984, *Jessup* 590 (A,BRI,CANB,K,L,MEL,MO,NSW,QRS,U), 592 (BRI,K,L,QRS), 594 (BRI); Freshwater Creek, near Cairns, Jun 1928, *Francis* (BRI); Cairns, in 1897, *Nugent* 188 (BRI); no date, *Manski* AQ210840 (BRI); Davies Creek, 17°05'S, 145°35'E, Aug 1954, *Smith* 5254 (BRI); in 1962, *Webb & Tracey* 7382 (BRI,CANB,QRS); Lock Creek, ca 12 miles [20 km] along Davies Creek Forestry Road, Oct 1962, *Smith* 12064 (BRI); end of Davies Creek Road, Jan 1962, *Webb & Tracey* 5600 (BRI); State Forest Reserve 607, 17°05'S, 145°35'E, Oct 1967, *Hyland* 3795 (BRI); State Forest Reserve 675, East Mulgrave Logging Area, 17°05'S, 145°40'E, Dec 1976, *Hyland* 9252 (BRI,QRS), 9253 (BRI,QRS); Jan 1977, *Gray* 268 (BRI,QRS); State Forest 185, Danbulla, 17°07'S, 145°37'E, Nov 1982, *Jessup* 538 (BRI); Danbulla, 17°09'S, 145°37'E, Sep 1949, *Byrne* 2 (BRI).

Distribution and Habitat: This variety is found from just north of Kuranda to Little Mulgrave River, in northern Queensland and occurs on uplands and foothills extending in places down to lower footslopes in notophyll vine forest mostly on soils derived from granite and metamorphic rocks.

Affinities: *P. mulgraveana* appears most closely related to *P. villosa* and both varieties differ from it by obovate to depressed obovate and shorter outer petals and the abaxial leaf surfaces being hirtellous, glabrescent.

Etymology: The valleys of the Mulgrave and Little Mulgrave River form a significant and central part of the species' distribution.

The Francis collection from Freshwater Creek was annotated by C.T.White sometime after 1930 with the following note: 'should say *M. froggattii* after examination of the types C.T.W.' This incorrect determination led to the subsequent misapplication of the name *Mitrephora froggattii* to this species by Queensland botanists.

4. *Pseuduvaria villosa* Jessup, sp. nov.

Frutex vel arbor usque 4 m alta. Folia oblanceolata vel obovata, acuminata obtusa vel acuta, supra hirtella glabrescentia infra villosa. Lamina 8–20 cm longa et 2–7 cm lata; basi rotundata vel parum cordata. Petiolus 2–4 mm longus, villosus. Flores axillares terminales vel superi ramali, pendentes solitari vel 2 vel 3 invicem maturantes. Pedicelli 30–50 mm longi, villosi; bractea submedia 0.8–1 mm longa. Lobi calycis ovati vel triangulares, acuti 2.5–4 mm longi, exter pubescentes intra glabri. Petala exteriora late ovata, acuta vel acuminata 10–15 mm longa et 8–10 mm lata, exter pubescentia intra glabra. Petala interiora exter pubescentia intra glabra; tholus 11–15 mm longus et 13–16 mm diametro; laminae 12–16 mm latae. Flores masculi: stamina 1.1–1.3 mm longa et 0.8–1 mm lata. Flores feminei: ovaria circa 40, pilosa; ovula 1 vel 2. Monocarpia matura obovoidea vel ellipsoidea, 15–20 mm longa, puberulenta, armeniaca. Semina 1 vel 2; testa scrobiculata, porphyrea. **Typus:** Queensland, Cook District: Crawford's Lookout to Tchupalla Falls track, Palmerston National Park, North Johnstone River, 17°37'S, 145°47'E, 15 Feb 1982, *Jessup* 472 & *Tracey* (male) (holo: BRI).

Shrub or small tree to 4 m high and 10 cm d.b.h. Branchlets $\pm$ flexuose. Innovations densely covered with long soft pale brown hairs. Leaves oblanceolate or obovate, acuminate, obtuse or acute, hirtellous, glabrescent above, villous below. Lamina 8–20 cm $\times$ 2–7 cm; base rounded or slightly cordate; midvein sunken above, raised below; secondary veins mostly 8–10 pairs. Petiole 2–4 mm long, villous. Flowers axillary, terminal or upper ramal, pendulous, solitary or 2 or 3 maturing successively. Pedicels 30–50 mm long, villous; submedial bract 0.8–1 mm long. Calyx lobes ovate or triangular, acute, 2.5–4 mm long, pubescent outside, glabrous inside. Outer petals broadly ovate, acute or acuminate 10–15 mm $\times$ 8–10 mm, pubescent outside, glabrous inside. Inner petals pubescent outside, glabrous inside; dome 11–15 mm long and 13–16 mm diameter; blades 12–16 mm wide. Male flowers: stamens 1.1–1.3 mm $\times$ 0.8–1 mm. Female flowers: ovaries *ca* 40, pilose; ovules 1 or 2. Ripe monocarps obovoid or ellipsoid, 15–20 mm long, puberulent, orange. Seeds 1 or 2; testa scrobiculate, red-brown. **Fig 2.**

Specimens examined. Queensland. COOK DISTRICT: Berner Creek, Innisfail, *Petrie* 23 (BRI); Lower Palmerston Highway, W of Innisfail, 17°34'S, 145°45'E, May 1972, *Webb & Tracey* 11446 (BRI); Gregory Falls, Lower Palmerston via Innisfail, in 1962, *Webb & Tracey* 6595 (BRI); Crawford's Lookout, 17°36'S, 145°47'E, Jan 1986, *Sankowsky & Sankowsky* 464 (BRI), 464A (QRS); Crawford's Lookout to Tchupalla Falls track, Palmerston National Park, North Johnstone River, 17°37'S, 145°47'E, Feb 1982, *Jessup* 472 & *Tracey* (BRI), 472A (BRI, QRS); Palmerston National Park, North Johnstone River, 17°36'S, 145°46'E, Dec 1984, *Jessup* 745 (BRI); Liverpool Creek, W of Silkwood, 17°44'S, 145°51'E, Dec 1984, *Jessup* 733 (BRI).

Distribution and Habitat: This species is found from the North Johnstone River to Liverpool Creek, in northern Queensland and occurs in the understorey of complex mesophyll vine forest on basalt derived soil or alluvial terraces formed substantially from basaltic parent material.

Affinities: *P. villosa* appears most closely related to *P. mulgraveana* and differs from it by the broadly ovate, acute or acuminate outer petals and the abaxial leaf surfaces being conspicuously villous.

Etymology: The specific epithet refers to the long soft hairs on the leaves and branchlets.

Acknowledgements

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**RACOSPERMA DELTOIDEUM (CUNN. EX. G.DON) PEDLEY
(LEGUMINOSAE: MIMOSOIDEAE) AND RELATED SPECIES
IN NORTHERN AUSTRALIA**

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Summary

New combinations are *Racosperma deltoideum*, *R. adenogonium*, *R. froggattii*, *R. stipulosum* and *R. sublanatum*, based on *Acacia deltoidea* Cunn. ex G.Don, *A. deltoidea* var. *pungens* Benth., *A. froggattii* Maiden, *A. stipulosa* F.Muell. and *A. sublanata* Benth., respectively. All species are described. Notes on their geographic ranges and habitats in the extreme north of Western Australia and in the Northern Territory and a key to their identification are given. *A. deltoidea* is lectotypified.

If the treatment of *Acacia* Miller *sens. lat.* proposed by Pedley (1986) is accepted then species currently referred to *Acacia* subg. *Phyllodineae* Seringe will have to be transferred to *Racosperma* Martius. Though it would be desirable to make the transfers *en masse*, practical considerations dictate a piecemeal approach. As the results of revisionary studies are published individual authors will have to decide whether to include *Racosperma* in *Acacia* or to treat it as a distinct genus. Having argued for the latter course, I therefore make new combinations under *Racosperma*. Names are available for all the described taxa under *Acacia*, though in the case of one species only at varietal rank.

The species treated here constitute, with *Racosperma praviifolium* (F.Muell.) Pedley and *R. amblygonum* (Cunn. ex Benth.) Pedley, the *Triangulares* group of *Acacia* section *Plurinerves* in the classification of Pedley (1978). They have usually setaceous stipules and plurinerved broadly falcate-ovate or triangular phyllodes. The flowers are in globular heads, rarely spikes, on peduncles solitary in the axils. Maslin (1978) dealt with the 4-merous members of the *Triangulares* group of *Acacia* section *Phyllodineae* and summarised the various ways Bentham had treated *Triangulares*. The type species of Bentham's original *Acacia* subseries *Triangulares* is the uninerved *Acacia biflora* R.Br. (syn. *A. triangularis* Benth.) (Pedley 1980). If the plurinerved species are considered to constitute a subseries different from the subseries *Triangulares* with uninerved species, then it has no legitimate name. No attempt will be made to name or typify it here. A detailed infrageneric classification of *Racosperma* would be of considerable value and interest but requires an appraisal of approximately 750 species. Little can be achieved in taking a group of only five of these in isolation.

Relationships of *R. deltoideum* and its immediate allies are not clear. The lobing of the calyxes and the striate corollas of some species, and the stipules of some suggest an affinity with species of *Racosperma* section *Lycopodiifolia*. The calyxes of *R. adenogonium* and *R. deltoideum* are similar, for example, to those of *R. lycopodiifolium* (Cunn. ex Hook.) Pedley and *Acacia adoxa* Pedley (see Fig. 1d & g, Pedley 1972). The characters may be the result of convergent evolution rather than an indication of true affinities but, as the affinities of the *Lycopodiifolia* are not at all obvious, the possibility of a relationship should not be dismissed.

Maiden (1920) when describing *Acacia froggattii* referred *A. stipulosa* to *A. deltoidea* and accepted *A. luehmannii*. Bentham (1864) had identified some specimens of Robert Brown, allegedly collected in southern Australia, as *A. sublanata*, to which he referred *A. praviifolia*. Court (1972) pointed out that Brown's specimens came from northern Australia and that *A. sublanata* and *A. luehmannii* were conspecific.

Distributions of species are given using the numbers of the map sheets of the 1:250 000 Topographic Map Series R502 produced jointly by the Division of National Mapping and the Royal Australian Survey Corps.

Key to Species

1. Leaves crowded on branchlets, narrowly oblong and obliquely curved or somewhat triangular-ovate, the upper margin curved but not abruptly so 4. **R. froggattii**
- Leaves not crowded, triangular, the lower margin $\pm$ straight, the upper with an abrupt curve or angle 2.
2. Corolla 2.7–4 mm long, calyx 2.3–3 mm long, both irregularly lobed with up to 11 lobes 3. **R. stipulosum**
- Corolla less than 2 mm and calyx less than 1 mm long, regularly 5-merous 3.
3. Branchlets with indumentum of white crisped hairs to 1 mm long. Pods linear, narrowed between the seeds, to 12.5 cm long, glabrous. Calyx almost truncate 5. **R. sublanatum**
- Branchlets with straight hyaline hairs and shorter glandular ones. Pods not narrowed between the seeds, to 6 cm long, with some long multicellular hairs. Calyx with linear lobes as long as or up to twice as long as the corolla 4.
4. Phyllodes with gland at the angle conspicuously extruded, hairs not glandular. Calyx lobes with spreading hairs along the whole length. Seeds $\pm$ longitudinal in the pod 2. **R. adenogonium**
- Phyllodes with gland at the angle usually not conspicuously extruded, some hairs glandular. Calyx lobes with glandular hairs at tip only. Seeds transverse in pod 1. **R. deltoideum**

1. *Racosperma deltoideum* (Cunn. ex G.Don) Pedley, comb. nov.

Acacia deltoidea Cunn. ex G.Don, Gen. Hist. 2: 401 (1832); Bentham, Fl. Austral. 2: 378 (1864). **Lectotype** (designated here): Montague Sound, 3rd Voyage of Mermaid, in 1820, *Cunningham* 293 (holo: BM n.v.; iso: K, PERTH, photographs of both).

Shrub to 3 m high. Branchlets with indumentum of gland-tipped hairs and longer (to 0.4 mm) straight hyaline hairs. Stipules 1.5 mm $\times$ ca 0.5 mm, indurated, acute with a distinct midrib, often horizontally orientated. Phyllodes $\pm$ sessile, triangular, the lower margin usually only slightly curved, produced into a pungent point, the upper with a definite angle, a gland, usually inconspicuous and rarely projecting, at the angle, rather thick, 3 longitudinal veins and some coarsely anastomosing ones not conspicuous, truncate or slightly concave on the margin between the gland and the point, 3–12(–20) mm $\times$ 1.6–5.6 mm, 1–3.5 times as long as wide, measured across the phyllode from the gland, the point 0.4–1.2 mm long, moderate indumentum similar to that of the stem. Heads of 30–40 flowers on peduncles 6–9(–16) mm long, single in the axils, the receptacle sometimes slightly elongate, pubescent; bracteoles long-pointed, bent a little below the middle sometimes projecting beyond the buds. Flowers 5-merous. Calyx 1 mm long, the tube ribbed, the ribs produced into lobes about as long as the tube, membranous between the ribs, hairs $\pm$ restricted to the tips of the lobes. Corolla ca 1.6 mm long, with hyaline hairs in the upper half. Stamens 3.5 mm long. Ovary minutely pubescent. Pod 6–8-seeded, flat, oblong, to 4 cm long, 8–10 mm wide on a stipe 4 mm long, indumentum of moderately dense, stiff, multicellular hairs to 0.9 mm long and much finer ones ca 0.3 mm long. Seeds arranged transversely, oblong, ca 5 mm $\times$ 2.5 mm; areole central closed, ca 2 mm $\times$ 0.4 mm; funicle cream, thickened and folded twice beneath the seed. **Fig. 2J–N.**

Specimens examined. Western Australia. Above headwaters of Helby River, 14°41'S, 128°04'E, Mar 1978, *Hartley* 14819 (BRI,CANB,PERTH); Euro Gorge, Drysdale River Nat. Park, 15°08'S, 126°44'E, Aug 1978, *Kenneally* 4363 (PERTH); Boomerang Bay, Bigge Is., Jun 1972, *Marchant* 72/116 (PERTH); Gorge, Lawley River, Jul 1921, *Gardner* 996 & 1496 (PERTH), & s.n. (NSW); Montague Sound, Sep 1820, *Cunningham* (K,PERTH, photo); Boongaree Is., S side of Prince Frederick Harbour, 15°45'S, 125°10'E, Jul 1973, *Wilson* 11372 (PERTH); Talbot

Bay, 23 km SE of Cockatoo Is., 16°15'S, 123°44'E, May 1983, *Fryxell & Craven* 3893 (BRI,CANB); Hidden Is., Buccaneer Arch., 16°15'S, 123°29'E, Jun 1982, *Kenneally* 8365 (PERTH); Sunday Is., Buccaneer Arch., 16°25'S, 123°11'E, Jun 1982, *Kenneally* 8302 (PERTH), Nov 1906, ex Herb. *Fitzgerald* (NSW); Lachlan Is., Buccaneer Arch., 16°38'S, 123°29'E, Jun 1982, *Kenneally* 8326 (BRI, PERTH); Stewart River valley, ca 82 km NNE of Derby, 16°34'S, 123°29'E, Jul 1977, *Telford* 6310 & *Butler* (NSW); Manning Gorge, ± 16°39'S, 125°55'E, Jun 1977, *Maloney* (NSW), *George* 15176 (PERTH); 40km SW of 'Mt Barnett' Stn, Phillips Range, 16°55'S, 125°48'E, Sep 1976, *Guymer* 601 (NSW); Plain Creek, W of 'Beverley Springs' H.S., Aug 1974, *George* 12228 (PERTH), *Kenneally* 1988 (PERTH); Fitzroy River, in 1879, *Forrest* (NSW,PERTH); Kings Sound, in 1869, *Hughes* (MEL,NSW); N.W. Coast, *Cunningham* (K).

Distribution: Western Australia in Gardner Botanical District, on shallow soil derived from limestone (1:250 000 map sheets: D51-12,16; D52-9,10; E51-3,4).

Lectotypification of the name *Acacia deltoidea* is necessary. Don's description of the species was probably based on a number of Cunningham's collections at the British Museum (Natural History), including one now referred to *Racosperma adenogonium*. As the protologue could apply to either species the lectotype is chosen to ensure that the generally accepted application of the name *Acacia deltoidea* is unchanged. The *Forrest* specimen cited above, which originated from the National Herbarium of Victoria (MEL), was determined there as *Acacia stipulosa*. The determination was later confirmed by C.A.Gardner who annotated the PERTH sheet 'Acacia stipulosa FvM/Agrees with the type'. This specimen or a duplicate may have been the source of the widespread belief that *A. stipulosa* and *A. deltoidea* were conspecific. Maiden (1920) placed *A. stipulosa* in the synonymy of *A. deltoidea* on the basis of the specimen 'comm. Dr.F.Stoward'. Stoward who was botanist with the Department of Agriculture of Western Australia from 1911 to 1917 (Hall 1978) probably passed on to Maiden part of the specimen received from Melbourne.

Gardner 996 & 1496 appear to constitute a single collection. They were collected at the same place on the same day. Their phyllodes (2 cm long) are about twice as large as those of other specimens but certainly should be referred to *R. deltoideum*. *Kenneally* 8365 and *Fryxell & Craven* 3893 have a conspicuous projecting gland similar to that of *R. adenogonium*, but the floral structure and indumentum suggest that they should be placed in *R. deltoideum*. Another collection, *Fitzgerald* 1421 (Edkins Range, Aug 1905 - see Fig. 1J & K) is more aberrant. Its phyllodes are small, though within the normal size range, with a somewhat projecting gland, and can scarcely be described as triangular. Because of its glandular hairs it is placed in *R. deltoideum*. Its flowers are too immature to be of value in identification.

2. *Racosperma adenogonium* Pedley, nom. et stat. nov.

Acacia deltoidea var. *pungens* Benthām, London J. Bot. 1: 333 (1842). Type: Western Australia: Greville Is., *Cunningham* (holo: K).

Dense shrub to 2 m high. Branchlets with indumentum of moderate to dense spreading hairs, sometimes with some shorter glandular hairs, occasionally the indumentum becoming sparse and the glandular hairs conspicuous. Stipules indurated, curved upwards, 2.5-5.5 mm long, united at the base sometimes for a quarter of their length. Phyllodes ± sessile, similar in shape to those of *R. deltoideum* but not as thick, the gland at the angle often conspicuously extruded, 3-6 longitudinal nerves prominent, scarcely any anastomoses between them, 3-15 mm × 1.6-7 mm, 1.5-3 times as long as wide, the point 0.5-2 mm long, indumentum of non-glandular hairs densest on veins. Heads of 40-60 flowers on peduncles 5-10 mm long, single in the axils, receptacle pubescent; bracteoles bent about one-third their length, narrowed into a long point with long hairs (0.2 mm long). Flowers 5-merous. Calyx 0.6-0.8 mm long, the tube glabrous, membranous with distinct ribs, the ribs produced into lobes as long as, or twice as long as the tube, hispidulous with hairs ca 0.3 mm long. Corolla 1.6-1.7 mm long, lobed to the middle, the lobes with a distinct midrib and hairs in the upper half. Stamens ca 3.5 mm long. Ovary minutely pubescent. Pod to ca 10-seeded, ± flat though raised over the seeds, to 6 cm long, 8 mm wide, indumentum of sparse erect multicellular hairs to 0.7 mm long and denser finer ones about one-third as long. Seeds arranged ± longitudinally, oblong, 5.5-6 mm × 3-3.5 mm; areole central, closed, pale, 2-3 mm × 0.6-0.8 mm; funicle cream, markedly thickened, folded twice beneath the seed. Fig. 1E-I.

Specimens examined. Western Australia, Camden Harbour, *Maitland Brown* (MEL); Unwin Is., Brunswick Bay, 15°18'S, 124°48'E, Jul 1973, *Wilson* 11445 (PERTH); Augustus Is., 15°25'S, 124°35'E, May 1972, *Wilson* 10702 & s.n. (sterile) (PERTH); Regents River, Voyage of Bathurst, in 1821-2, *Cunningham* 323 (BM, n.v., PERTH, photo); Gibb River road, ± 17 miles [27 km] N from turn-off to 'Mt House' Homestead, Jul 1974, *Willis & Beaglehole* (MEL,NSW,PERTH).

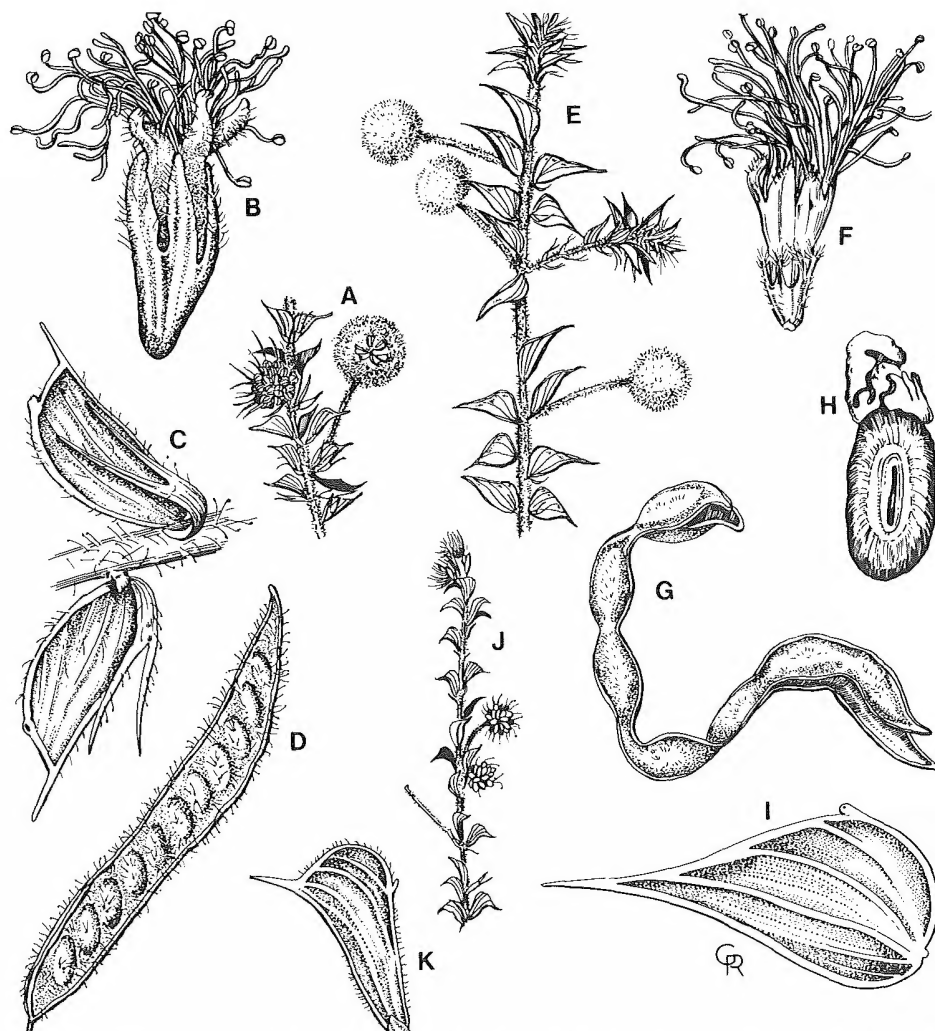


Fig. 1. *Racosperma stipulosum*: A. flowering branchlet $\times 1$. B. flower $\times 12$. C. phyllode and stipules $\times 6$. D. pod $\times 1$ (all Latz 5329). *R. adenogonium*: E. flowering branchlet $\times 1$. F. flower $\times 12$. G. pod $\times 1$. H. seed $\times 4$. I. phyllode $\times 6$. (all Kenneally 1988). *R. deltoideum* (aberrant individual): J. branchlet $\times 1$. K. phyllode $\times 6$ (both Fitzgerald 1421).

Distribution: Western Australia in Gardner Botanical District, on sandy soil, usually on sandstone (1:250 000 map sheets: D51-16; E51-4).

3. *Racosperma stipulosum* (F.Muell.) Pedley, *comb. nov.*

Acacia stipulosa F.Muell., J. Proc. Linn. Soc., Bot. 3: 119 (1859). **Type:** Upper Victoria River, Mueller 71 (holo: MEL; iso: K).

Intricately branched shrub to 3 m high. Branchlets with indumentum of stiff spreading multicellular hairs and shorter gland-tipped ones. Stipules about two-thirds as long as the phyllodes, indurated, subulate, united for one-third to half of their length. Phyllodes crowded, $\pm$ sessile, $\pm$ triangular, the lower margin straight, produced into a pungent point, the upper curved or angled with a gland about midway or at the angle, sometimes projecting, thick, 4-6 longitudinal nerves apparent, 6-8 mm $\times$ 3-5 mm, 1.5-2.5 times as long as wide, the point 0.5-2 mm long, sparse indumentum similar to that of the

stems. Heads of 30–40 flowers on peduncles about as long as the phyllodes, single in the axils; receptacle pubescent; bracteoles long-pointed, linear lanceolate, bent somewhat about the middle, projecting slightly beyond the open flower. Flowers with irregularly lobed calyx and corolla. Calyx 2.3–3 mm long, cartilaginous, ribbed, with stiff $\pm$ spreading hairs *ca* 0.2 mm long particularly in upper half, lobes 8–11, 0.5–1 mm long. Corolla 2.7–4 mm long with 7–8 uninerved lobes 0.6–0.8 mm long, up to half as long again as the calyx, with short stiff spreading hairs on the back of the lobes. Stamens *ca* 4.5 mm long. Ovary glabrous. Pod up to 10-seeded, flat but raised slightly over the seeds, straight, obliquely veined, up to 8 cm long, 5–6 mm wide, with straight multicellular gland-tipped hairs, many of them 3 mm long. Seeds arranged obliquely, *ca* 4 mm long, 2 mm wide; areole closed, central, $\pm$ square with a pale pleurogram; funicle folded 2–3 times, thickened into a basal aril. **Fig. 1A–D.**

Specimens examined. Northern Territory. VICTORIA RIVER DISTRICT: 74 km SW of 'Victoria River' Homestead, 16°47'S, 130°39'E, Jun 1978, *Latz* 5439 (BRI, PERTH); 26 miles [42 km] S of Hookers Creek–Birringdudu–Tanami Junction, Jul 1973, *Maconochie* 1741 (BRI, CANB, K, PERTH); 101 km from Tanami towards 'Gordon Downs', 19°26'S, 129°05'E, Aug 1971, *Gittins* 2375 (BRI, MEL); 25 miles [40 km] S of Hookers Creek Mission, Jun 1952, *Perry* 2916 (CANB); 34 miles [54 km] SW of Hookers Creek, Jul 1956, *Chippendale* NT 2257 (CANB, MEL); 37 miles [59 km] SW of Hookers Creek, May 1971, *Maconochie* 1120 (MEL).

Distribution: Northern Territory in Victoria River District, on shallow soil on sandstone (1:250 000 map sheets: E52–4, 12, 15).

4. *Racosperma froggattii* (Maiden) Pedley, **comb. nov.**

Acacia froggattii Maiden, J. & Proc. Roy. Soc. New South Wales 53: 204 t.14 (8–16) (1920). **Type:** Woollybutt Creek near Phillips Range, May 1905, *Fitzgerald* 981 (iso: MEL, PERTH).

Shrub to *ca* 1 m high. Branchlets terete with indumentum of moderately dense spreading hyaline hairs to 0.3 mm long, most of them gland-tipped. Stipules *ca* 1 mm long, brown setaceous with a few long hairs. Phyllodes crowded, often subfascicular on the branchlets, $\pm$ sessile, narrowly oblong and obliquely curved or somewhat triangular-ovate, contracted into a short point, the upper margin curved with a small gland, with a narrow rim, at about the middle, but no abrupt angle at the gland, the margins nerve-like with about three other longitudinal nerves $\pm$ conspicuous, 3.5–5.5 mm $\times$ 1.2–2.6 mm, 1.2–3.3 times as long as wide, the point 0.5–0.7 mm long, moderate indumentum similar to that of the stems. Heads of 30–40 flowers on peduncles 1–1.5 cm long, single in the axils; bracteoles with long pointed narrowly ovate laminae at an angle to the claws, about as long as the buds. Flowers 5-merous. Calyx 0.8–1 mm long, the tube ribbed, the ribs produced into setaceous lobes about as long as the tube, hairs confined to the lobes. Corolla 1.4–1.5 mm long, thick, striate, with hyaline hairs on the lobes. Stamens *ca* 3.5 mm long. Ovary glabrous. Pod with about 5 seeds, slightly raised over the seeds, linear, curved, 3.5–4 cm long, 4–5 mm wide, indumentum of moderately dense multicellular glandular hairs to 1 mm long and finer ones to 0.3 mm long. Seeds arranged longitudinally, oblong-cylindrical *ca* 6 mm $\times$ 2.5 mm; areole central, closed with a double pleurogram, *ca* 2 mm $\times$ 0.5 mm; funicle whitish, thickened and folded twice beneath the seed. **Fig. 2A–E.**

Specimens examined. Western Australia. Artesian Ra. between Charnley River gorge and head of Walcott Inlet, Aug 1943, *Davis* (PERTH); Woollybutt Creek near Phillips Range, May 1905, *Fitzgerald* 981 (MEL, PERTH); 16 miles [26 km] SW of 'Mt House' Stn, Jul 1959, *Lazarides* 6450 (BRI, CANB, MEL, PERTH). Northern Territory. 5 miles [8 km] ENE of 'Coolibah' Stn, Aug 1949, *Perry & Lazarides* 2699 (BRI, CANB, MEL, NSW, PERTH); near Fitzroy east of Timber Creek, Jun 1977, *Beswick* B104 (BRI).

Distribution: Western Australia in Gardner Botanical District and the Northern Territory in the Victoria River District on shallow sandy soil derived from sandstone (1:250 000 map sheets D52–16; E51–4, 8).

5. *Racosperma sublanatum* (Benth.) Pedley, **comb. nov.**

Acacia sublanata Benth. in Endlicher *et. al.*, Enum. Pl. 142 (1837); Court, *Muelleria* 2: 159 (1972). **Type:** Australia, *Bauer* Herb. Mus. Vind. 1837 (holo: K).

Acacia luehmannii F. Muell., *Fragm.* 11: 116 (1881), *Iconog. Austral.* *Acacia*, Decade 7 (1887). **Type:** Liverpool River, *B. Gulliver* (holo: MEL; iso: K).

Spindly shrub to 2.5 m high, often much shorter and compact, reported to be semiprostrate in exposed situations near the sea. Branchlets terete with indumentum of white crisped

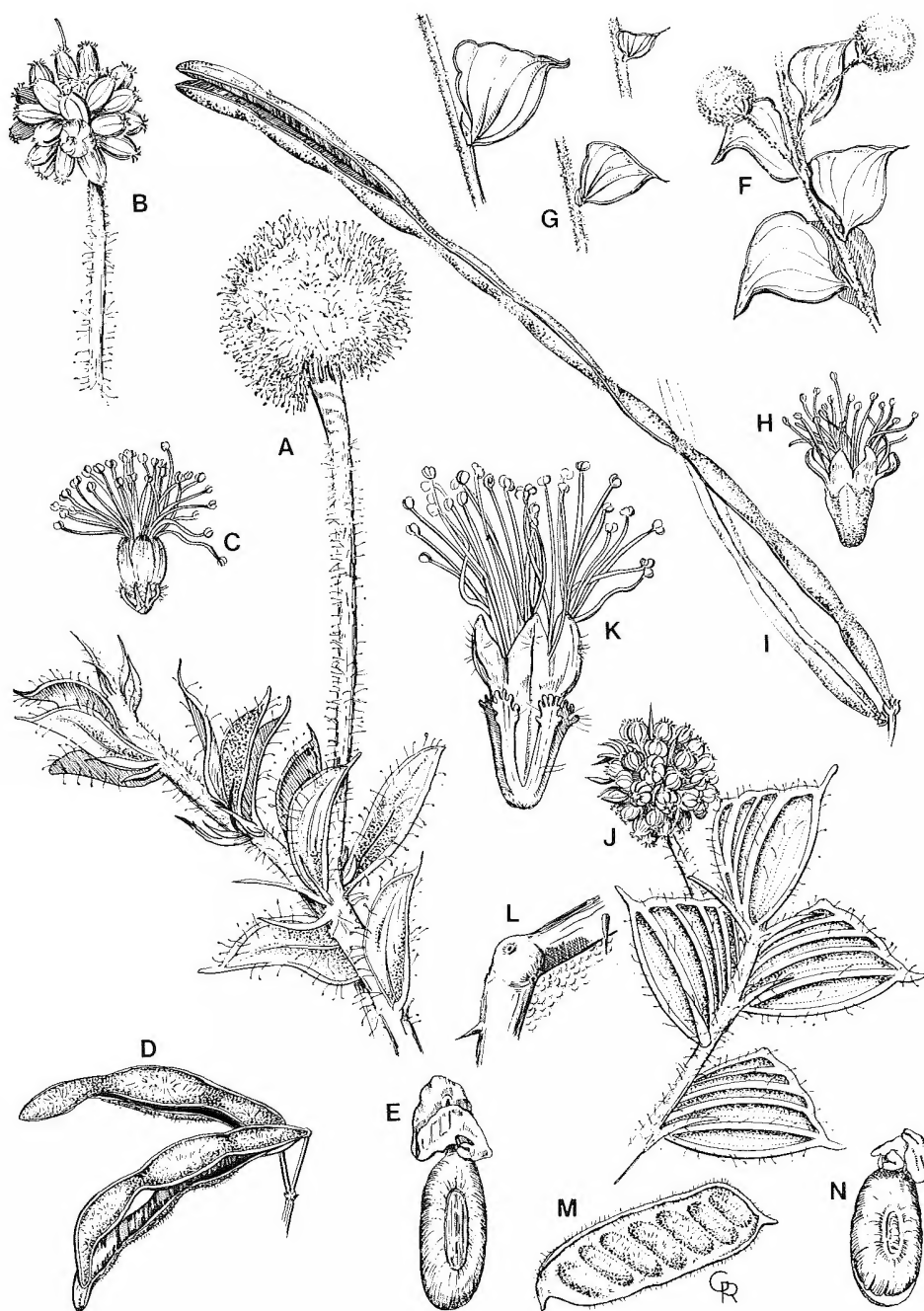


Fig. 2. *Racosperma froggattii*: A. flowering twig (Perry & Lazarides 2699) $\times 5$. B. inflorescence $\times 5$. C. flower $\times 6$. D. pod $\times 1$. E. seed $\times 4$ (B,C,D,E Lazarides 6450). *R. sublanatum*: F. flowering branchlet $\times 1$. G. phyllodes $\times 1$. H. flower $\times 6$. I. pod $\times 1$ (all Maconochie 1592). *R. deltoideum*: J. flowering branchlet $\times 4$. K. flower $\times 12$. L. gland on phyllode $\times 25$. M. pod $\times 1$. N. seed $\times 4$. (J,K,L Kenneally 2081; M,N Kenneally 4363).

hairs to 1 mm long, occasionally dense and hiding the stems. Stipules setaceous, brown, 3-nerved at the base, 1(–2.5) mm long. Phyllodes sessile, deltoid, shining, glabrous or pubescent with hairs similar to those of the stem, 2.5–11 mm $\times$ 1.5–9 mm, 0.9–1.4 times as long as wide, the margins thickened, yellow, with 3–5 longitudinal nerves with some anastomoses between them, the lower margin straight or curved, produced into a point (0.5–)1–2 mm long, the upper margin $\pm$ straight parallel to the stem then abruptly curved through more than 90° then straight again to the point, a small gland on the margin on or slightly below the abrupt curve. Heads usually of about 30 flowers but occasionally only 10 and rarely elongating into a dense spike *ca* 10 mm long, on peduncles with hairs similar to those of the stem, 7–10(–20) mm long; bracteoles bent in the middle, cuneate at the base with a point longer than the flower buds. Flowers 5-merous. Calyx 0.7–0.9 mm long, rather membranous but with 5 ribs extending into short obtuse lobes, glabrous or sometimes with some hairs on the margin of the lobes. Corolla 1.5–1.8 mm long, glabrous. Stamens *ca* 3.5 mm long. Ovary densely pubescent. Pod with *ca* 10 seeds, straight, linear, convex over the seeds, and somewhat narrowed between them, glabrous, 12.5 cm long, 4 mm wide. Seeds arranged longitudinally, oblong, *ca* 6 mm long, 2.5 mm wide; areole central, open, 4.5 mm $\times$ 1 mm; funicle whitish, thickened and folded 2–3 times beneath the seed. Fig. 2F–I.

Specimens examined. Northern Territory, 88 km from Pine Creek, UDP Falls road, Jul 1973, *Gittins* 2667 (BRI); Gorge near Plumtree Creek, *ca* 47 miles [75 km] ENE of Pine Creek, Mar 1965, *Lazarides & Adams* 171 (BRI,CANB,MEL); Deaf Adder Basin, Jun 1972, *Schodde* A79 (BRI,CANB); East Alligator River, 12°47'S, 133°21'E, Jul 1972, *Lazarides* 7647 (BRI,CANB); *ca* 16 km S of Oenpelli Mission, 12°29'S, 133°03'E, Jul 1973, *Adams & Dunlop* 2974 (BRI); 10 miles [16 km] W of Goomadeer turn, Oenpelli–Mangarida road, Jun 1974, *Jacobs* 1899 (CANB); 7 miles [11 km] E of Rum Bottle Creek, 12°04'S, 133°48'E, Jun 1972, *Maconochie* 1592 (BRI,CANB,MEL,PERTH); 5 miles [8 km] SW of BHP camp airstrip, 12°52'S, 135°15'E, Jun 1972, *Maconochie* 1489 (BRI,MEL,PERTH); 21 miles [33 km] E of Lake Evella, 12°45'S, 136°35'E, Jun 1972, *Maconochie* 1519 (BRI,MEL); Mt Saunders, Gove, Oct 1971, *Hinz* in NT 33630 (BRI,MEL); Yirrkala, 12°12'S, 136°47'E, Jul 1948, *Specht* 758 (BRI,CANB,MEL); Groote Eylandt, Jul 1948, *Specht* 668 (BRI).

Distribution: The extreme northern part of the Northern Territory on sandy soils, sometimes shallow, usually on sandstone but recorded also from coastal dunes (1:250 000 map sheets: D53–1,2,3,4,5,8).

Bentham (1864) referred *Acacia pravifolia* to *A. sublanata* and recorded it as 'South Coast, *R. Brown*'. Court (1972) clarified the matter after examining types and *Brown* material from northern Australia. *A. pravifolia* has straight hairs, smaller heads on shorter peduncles and obtuse broad-based bracteoles. In *R. sublanatum* there is considerable variation in the size of phyllodes from plant to plant but indumentum and floral characters show only a small range of variation, and there are no grounds for recognising infraspecific taxa.

The occurrence of plants with flowers in spikes rather than in heads is an example of how closely allied *Acacia* section *Plurinerves* and *A.* section *Juliflorae* are. These two sections have been combined as *Racosperma* section *Plurinervia* (Pedley 1986).

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NOTES ON *RACOSPERMA* MARTIUS (LEGUMINOSAE: MIMOSOIDEAE), 1

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Summary

R. armillatum, *R. ommatospermum*, *R. paniculatum*, and *R. homalocladum* (F.Muell.) Pedley, with which *R. paniculatum* has been confused, are described. Flowers of *R. fleckeri* (Pedley) Pedley, are described for the first time. These are all members of the 'Oligoneura group' of *Racosperma* which is here defined. Other new species are *R. meiospermum* and *R. polyadenium*. All species are referred to *Racosperma* sect. *Plurinervia*.

Species of *Acacia* Miller subg. *Phyllodineae* (DC.) Searge (*A.* subg. *Heterophyllum* Vassal) should be referred to the genus *Racosperma* Martius (Pedley 1986). Only a small proportion of the formal transfer of names has been made. A checklist of Queensland species is included in this volume (Pedley 1987).

Since publication of the revision of the Queensland species (Pedley 1978, 1980 as *Acacia*) several others have been described for the State (Pedley 1981, Pedley & Forster 1986). Five species from tropical Queensland are described here. All are referred to *Racosperma* sect. *Plurinervia* (Benth.) Pedley.

***Racosperma meiospermum* Pedley, sp. nov.** floribus parvis, sepalis petalisque villosis instructis, phyllodiis crebris parallelis longitudinalibus nervis *R. brassii* (Pedley) Pedley simulat; autem resina multarum ramulorum apices versus phyllodiis brevioribus secus axem brevem axillarem dispositis, leguminibus non moniliformibus seminibus parum brevioribus differt. **Typus:** Sandy Tate River, Feb 1928, *Brass* 1745 (holo: BRI; iso: CANB,K,MO).

Shrub to 3 m high, young branchlets angular, red-brown, resinous, sometimes with scattered hairs to 1 mm long, becoming grey and terete when old. Phyllodes straight or slightly falcate, the lower margin $\pm$ straight, the upper curved, covered with brown resin when young, losing it when older, 7-12.5 cm long, 2-3 cm wide, 3-5 times as long as wide, with many close parallel, non-anastomosing nerves, 3-5 more prominent than the rest; gland basal or almost so. Pulvinus 5-10 mm long. Stipules ovate, to 3 mm long when phyllodes first formed. Flowers in dense spikes 1.6-2 cm long, the rachis and peduncles with dense white hairs; peduncles 5 mm long, subtended by a striate concave bract to 3 mm long when young, arranged along an axillary axis, usually extremely short so that a group of 3-4 spikes is produced in each axil but occasionally the axis growing out into a leafy shoot with spikes well spaced along it. Flowers 5-merous. Calyx lobes narrowly oblong, slightly widened and thickened at the tip, free almost to the base, 1.5 mm long, villose with white hairs. Corolla lobes $\pm$ free, 1.7 mm long, a few long hairs along the midline. Stamens 3-4 mm long. Ovary not seen (none present in flowers examined). Pods with up to 12 seeds, 8 cm long, 3 mm wide, obscurely longitudinally ribbed. Seeds 3.5 mm long, about twice as long as wide, longitudinally arranged; funicle creamy white, thickened and 2-3 times folded forming aril at base of seed; pleurogram fine, associated with pale area of seed coat; areole small with a narrow opening, about twice as long as wide. **Fig. 1C-E.**

Specimens examined. Queensland. COOK DISTRICT: Near Lappa, 17°23'S, 144°48'E, May 1982, *Pedley* 4855 (BRI); Koorboora, 17°43'S, 144°48'E, Jan 1982, *Pedley* 4841 (BRI); Sandy Tate River [approx. 17°40'S, 144°40'E], Feb 1928, *Brass* 1745 (BRI,CANB,K,MO).

Distribution: The species is confined to a small area about 40 km south-east of Chillagoe where it forms pure stands on shallow stony soils.

Notes and Observations: Young plants are pubescent and long hairs persist on the branches and phyllodes of some mature plants. The resemblance to *R. brassii* may not indicate a close relationship. The structure of the inflorescence suggests a relationship

with *R. juliferum*, *R. blakei* and other species which have spikes arranged along an axillary axis. Most juliflorous species in section *Plurinervia* have spikes in pairs. This may be a derived condition, representing an extreme reduction of the axis.

Racosperma polyadenium Pedley, *sp. nov.* affinis *R. drepanocarpa* (F.Muell.) Pedley phyllodiis minus coriaceis 2–4 glandulis ornatis, calycibus parvioribus et leguminibus parvioribus differt. **Typus:** Shaw Is., Lindeman Group, 6 Nov 1985, *G.N. Batianoff* 3354 & *C. Dalliston* (holo: BRI; iso: K,MO,NSW).

Shrub or small tree; branchlets slender, angular, at first very resinous. Phyllodes straight or slightly falcate, reddish brown and resinous when young, losing resin when old, somewhat acute with callus tip, 40–85 mm long, 2.8–5 mm wide, 12–20 times as long as wide, longitudinal parallel nerves not crowded (about 14 when phyllodes is wide), midnerve always conspicuous and two others sometimes so when phyllode is wide; gland small, basal, with 1–3 small glands along the margins, the lowest 12–25 mm from the base, the others at irregular intervals. Pulvinus *ca* 1 mm long. Stipules linear, about as long as the pulvinus, caducous. Flowers in somewhat open spikes, singly or in pairs in the upper axils; peduncles *ca* 6 mm long, resinous; rachis 12–20 mm long, resinous, elongating quickly following anthesis. Flowers 5-merous. Calyx wide cup-shaped, not closely investing the corolla, pale, membranous, glabrous, 0.6 mm long, lobed to about the middle the lobes lacking a midrib, somewhat thickened, apiculate, reflexed. Corolla *ca* 1.5 mm long, lobed to about the level of the calyx, petals reflexed. Stamens *ca* 2 mm long. Ovary densely pubescent. Pods with up to 8 seeds, 4.5 cm long, widest at the top, tapering to the base, rather woody, resinous, with margins thickened and obscurely longitudinally nerved faces, opening elastically from the top. Seeds not seen.

Specimens examined. Queensland. NORTH KENNEDY DISTRICT: Palm Is., *Henne* (MEL 108106). SOUTH KENNEDY DISTRICT: Whitsunday Is., *Henne* (MEL 108105); Shaw Is., Lindeman Group, Jun 1985, *Warrian* (BRI), Nov 1985, *Batianoff* 3354 & *Dalliston* (BRI,K,MO,NSW).

Distribution: The species is known from only three islands, one in the Lindeman Group, one in the Whitsunday Group and the other in the Palm Group some 350 km to the north-west. Such a distribution is unusual. None of the other narrowly distributed species of *Racosperma* of north-eastern Australian is confined to islands (see Maslin & Pedley 1982). Some of the islands of the central Queensland coast are visited by a lot of people each year and it is therefore remarkable that more than 100 years separated the collections of *Henne* and *Warrian*.

Ecology: Ecological data are scanty. *Warrian* noted *R. polyadenium* as a small tree growing in heathland on a hillside overlooking the beach, while *Batianoff* and *Dalliston* reported it as a prostrate shrub 30 cm tall growing in wind-shorn scrub 3–4 m tall at an altitude of 42 m.

Notes and Observations: *Bentham* (1864, p. 402) referred both of *Henne*'s specimens to *Acacia drepanocarpa*. The only other specimen cited by him was the type specimen which lacks flowers. Consequently he based his description of the flowers on the only flowering material available to him, which was *Henne*'s Palm Is. specimen. The description is, however, not an accurate one. As already pointed out (Pedley 1978) the phyllodes of *A. drepanocarpa* illustrated by *Mueller* (1888) hardly belong to that species. They are a reasonable representation of the phyllodes of *R. polyadenium*.

The 'Oligoneura group'

The species keyed below belong to the complex of species related to *R. excelsum* (Benth.) Pedley (see Pedley 1978, p. 84). These are characterised by having phyllodes on short pulvinuses with prominent widely spaced longitudinal nerves with open, sometimes obscure, anastomosing nerves between them. The flower heads are in pairs or several pairs in the phyllode axils or, in one species, at nodes along leafless axes. One head matures before the other of the pair and the calyx lobes are ultimately free. Since one species of the complex, *R. simsii* (Benth.) Pedley is the lectotype of the name *Acacia* subseries *Oligoneurae* Benth. (Pedley 1980), the species are referred to here as the 'Oligoneura group'. *Bentham* (1864) knew only four of the species included here, which he referred to two different subseries.

A key to Australian species of the 'Oligoneura group'

1. Heads on peduncles to 1 cm long in twos or threes at nodes along leafless axes forming a terminal panicle **R. paniculatum**
 Heads on peduncles in pairs or several pairs in upper axils, not forming a terminal panicle 2
2. Phyllodes to 7 mm wide 3
 Phyllodes more than 7 mm wide 6
3. Phyllodes 9–12 times as long as wide, 4–5 cm long **R. excelsum** subsp. **angustum**
 Phyllodes 13–40 times as long as wide, 5.5–12 cm long 4
4. Pods moniliform, valves membranous. Tree to 12 m with pendulous foliage **R. estrophiolatum**
 Pods flat with nerve-like margins, convex over the seeds, occasionally constricted between them. Shrubs to 4 m, foliage not pendulous 5
5. Phyllodes widest about the middle, acute, sometimes apiculate; peduncles 5–8 mm long. Pods 4–5(–7) mm wide **R. simsii**
 Phyllodes widest above the middle, acuminate; peduncles 3–4 mm long. Pods 8 mm wide **R. ramiflorum**
6. Branchlets flattened, winged. Funicle folded, at least half encircling the seed 7
 Branchlets acutely angled, not flattened. Funicle folded or not, encircling the seed or not 8
7. Phyllodes (12–)16–30(–45) mm wide with 9 prominent longitudinal nerves. Pods 10–15 cm long. Funicles completely encircling the seeds . . **R. complanatum**
 Phyllodes 9–15(–20) mm wide with three prominent longitudinal nerves. Pods to 8.5 cm long. Funicles half encircling the seeds **R. homalocladum**
8. Phyllodes thick with anastomosing nerves hidden, margins ribbon-like, somewhat papillose with a prominent gland at the base **R. multisiliquum**
 Phyllodes not markedly thick with anastomosing nerves visible, margins neither ribbon-like nor papillose 9
9. Pods strongly constricted between the seeds, breaking up into 1-seeded segments. Funicles not folded 10
 Pods not constricted between the seeds, not breaking up; often with parallel nerve-like margins and convex over the seeds. Funicles sometimes strongly folded 11
10. Phyllodes usually 4–6.5 cm long with 3–6 parallel nerves. Areole of seeds small **R. excelsum** subsp. **excelsum**
 Phyllodes 7.5–15 cm long with up to 10 parallel nerves. Areole large **R. armillatum**
11. Funicle encircling the seed. Phyllodes straight, 13–40 mm wide **R. fleckeri**
 Funicle sometimes folded but not encircling the seed. Phyllodes at least slightly falcate, 7–20 mm wide 12

12. Phyllodes strongly falcate, widest above the middle, 12–18 cm long. Pod with a well defined, raised pale margin when mature. **R. legnotum**
- Phyllodes either not strongly falcate or widest at or below the middle.
Pod without a pale raised margin 13
13. Phyllodes widest near the top. Pod 6–8 mm wide. Seeds with a prominent pleurogram with a pale line **R. ommatospermum**
- Phyllodes widest at or below the middle. Pod *ca* 12 mm wide. Seeds with pleurogram lacking a pale line **R. hyalonomum**

Racosperma paniculatum Pedley, *sp. nov.* affinis *R. homaloclado* (F.Muell.) Pedley floribus grandioribus, funiculis semina non dimidio cingentibus, conspicuissime capitulis dispositis in paniculis terminalibus differt. **Typus:** 27 km N of 'Wakooka' on track to Bathurst Bay, June 1984, *J.R. Clarkson* 5375 (holo: BRI; specimina ad DNA, K,MBA,MEL,NSW,PERTH distributa, non visa).

Shrub or slender tree to 6 m, usually with a conspicuously white trunk; branchlets glaucous, angular, with phyllodes borne on short spurs. Phyllodes oblong, slightly curved, obtuse apiculate, 6–10(–12.5) cm long, 12–20(–25) mm wide, (3.5–)4.5–6.5 times as long as wide, three longitudinal nerves prominent, coarsely reticulate between them, the lower decurrent with the margin at the extreme base, gland prominent but without a rim, up to 4 mm from the base, abruptly narrowed into a short pulvinus. Heads of 25–30 flowers on peduncles 8–10 mm long in pairs (one head maturing before the other) on leafless axes to 12 cm long, terminating branchlets and in the upper axils, forming terminal panicles. Flowers glabrous, 5-merous. Calyx lobes free to the base, 1–1.3 mm long with a filiform claw and a rhomboidal lamina 0.25 mm wide. Corolla lobes united to the middle, 1.7–2.5 mm long. Stamens 3.5–4.5 mm long. Ovary glabrous. Pods straight, flat, convex over seeds, not at all constricted between them, glabrous, to 10 cm long, 8–9 mm wide, with up to 9 seeds. Seeds arranged longitudinally, funicle hardly thickened or folded, not seen mature. **Fig 1A-B.**

Specimens examined. Queensland. COOK DISTRICT: 27 km N of 'Wakooka' on the track to Bathurst Bay, *ca* 14°20'S, 144°20'E, June 1984, *Clarkson* 5375 (BRI; DNA,K,MBA,MEL,NSW,PERTH *n.v.*); Cape Flattery, 14°55'S, 144°20'E, Jun 1975, *Sharpe* 1505 (BRI); between 'Starke' & Cape Flattery, 15°02'S, 145°20'E, July 1976, *Webb & Tracey* 13549 (BRI); 4 km E of Hopevale–'Starke' road, 15°04'S, 145°20'E, Jun 1984, *Clarkson* 5327 (BRI); between McIvor River & Cape Flattery, 15°05'S, 145°15'E, Nov 1972, *Hyland* 6539 (BRI); 3 miles [5 km] from Pt Archer towards Cooktown, [15°35'S, 145°15'E], Jun 1972, *Wrigley & Telford* 1308 (BRI); Yarrabah, [16°55'S, 145°52'E], Aug 1918, *Michael* AQ191143 (BRI). NORTH KENNEDY DISTRICT: Hinchinbrook Is., Ramsay Bay, 18°20'S, 146°19'E, Aug 1975, *Sharpe* 1787 (BRI).

Distribution: The species is common on sand in heath or in the heathy understory of eucalypt open forest on sand in the Cape Flattery area with isolated populations at Yarrabah and on Hinchinbrook Is.

Flowering period: June.

Fruiting period: Fruits probably mature about September.

Notes and Observations: It has been confused with *R. homalocladum* (Pedley 1978), but differs in having larger flowers, a funicle which does not half encircle the seed, and most conspicuously, heads in terminal panicles. It is described as an attractive short-lived plant with deep yellow flowers.

Racosperma homalocladum (F.Muell.) Pedley, *Austrobaileya* 2: 350 (1987).

Acacia homaloclada F.Muell., *Fragm.* 11: 34 (1878), *Iconog. Austral.* *Acacia*, Decade 8 (1887); Pedley, *Austrobaileya* 1: 214 (1978).

A spindly shrub to 3.5 m, young growth pink, all parts glabrous; branchlets acutely angled or winged, the phyllodes borne on short spurs decurrent with the wings. Phyllodes narrowly ovate, only slightly falcate, 6.5–10(–12) cm long, 9–15(–20) mm wide, 4.5–10 times as long as wide, narrowed at the tip, but obtuse with a small apiculum and a small gland on its dorsal side, narrowed into a pulvinus 2–5 mm long, a conspicuous gland 3–6 mm from the base; 3 longitudinal nerves conspicuous with inconspicuous loosely anastomosing nerves between them (similar to those of *R. multisiliquum*). Heads of 20–30 flowers on peduncles 10–15 mm long in two pairs in the upper axils, one head

of each pair opening before the other. Flowers 5-merous; bracteoles with a thick peltate lamina almost perpendicular to the claw. Calyx lobes free to the base, spatulate, 1 mm long. Corolla lobes united to the middle, somewhat flattened at their tips, 1.8 mm long; stamens *ca* 3.5 mm long; ovary glabrous. Pods straight, glaucous, not at all contracted between the seeds, flat, convex over the seeds, nerve-like margins, 85 mm long, 9–11 mm wide, with up to 10 seeds. Seeds arranged longitudinally, *ca* 5 mm long and 3 mm wide (immature); areole large, closed; funicle thickened into a fold to half encircle the seed.

Specimens examined. Queensland. NORTH KENNEDY DISTRICT: Hinchinbrook Is., Deluge Inlet, 18°23'S, 146°12'E, Jun 1979, A. & M. Thorsbourne (BRI); Hinchinbrook Is., Little Ramsay Bay, *ca* 18°20'S, 146°10'E, Aug 1975, Sharpe 1625 (BRI); Hinchinbrook Is., May 1986, Warrian CW5064 (BRI); Waterfall Creek, N of Ingham, [18°26'S, 146°09'E], Jan 1977, coll. unknown AQ378611 (BRI); Rungoo, [18 km N of Ingham, 18°28'S, 146°10'E], Jan 1952, King AQ191140 (BRI).

Distribution: *Racosperma homalocladum* is restricted to Hinchinbrook Island and a small area of the mainland opposite.

Flowering period: summer.

Fruiting period: Young fruits have been collected in June.

Notes and Observations: It has been confused with *R. paniculatum* which is more widely distributed but which also occurs on Hinchinbrook Island. The two species occupy different habitats. *R. paniculatum* is restricted to sand in heath or in heathy understorey of eucalypt open-forest whereas *R. homalocladum* occurs in light rainforest or open-forest on stony soil often near streams.

***Racosperma armillatum* Pedley, sp. nov.** affinis *R. excelso* (Benth.) Pedley phyllodiis coriaceioribus basin versus angustatis valdius, leguminibus inter semina constrictis valdius differt. **Typus:** 12 km SE of Mt Janet on Survey road along Great Dividing Range, *ca* 11.5 km SW of Lakeland Downs township, 15°56'S, 144°46'E, Jan 1986, J.R. Clarkson 6291 (holo: BRI; iso: CANB,DNA,K,MEL,MO,NSW,PERTH,QRS,SAN).

Tree to 8 m with rough grey bark at base; branchlets somewhat angular, soon becoming terete and obscurely ribbed, lenticellate. Phyllodes glabrous, oblanceolate, spatulate, obovate or elliptic, variable in width often on a single plant, straight or falcate when narrow, 75–150 mm long, 5–15(–30) mm wide, 4–13 times as long as wide, up to 180 mm long on young plants, with up to 10 distinct longitudinal nerves with numerous oblique secondary nerves between them; gland small prominent, not rimmed, up to 2.5 mm from the base. Pulvinus 1.5 mm long. Heads of 20–30 flowers on peduncles 3–6 mm long in one or in two pairs in the upper axils, peduncles arising from an axis *ca* 1 mm long, one head maturing before the other of the pair. Flowers glabrous. Calyx lobes linear, widened and subacute at the tip, 1 mm long, united only at the base. Corolla lobes 1.5 mm long. Ovary glabrous. Pods flat with up to 8 seeds, 80 mm long, 6–10 mm wide, strongly constricted between the seeds, the isthmus only 2 mm wide when pods mature; valves with wing *ca* 0.7 mm wide and raised veins, breaking up into 1-seeded indehiscent segments. Seeds arranged longitudinally *ca* 5 mm long, 3 mm wide; pleurogram obscure; areole large, open; funicle not thickened and scarcely folded. **Fig. 1F-I.**

Specimens examined. Queensland. COOK DISTRICT: 12 km SE of Mt Janet on Survey road along Great Dividing Range, *ca* 11.5 km SW of Lakeland Downs township, 15°56'S, 144°46'E, Sep 1984, Clarkson 5507 (BRI), Jan 1986, Clarkson 6288 (BRI,DNA,K,NSW,PERTH), Jan 1986, Clarkson 6291 (BRI,CANB,DNA,K,MEL,MO,NSW,PERTH,QRS,SAN); Top of Fall Creek Gap, Wentlock-Iron Range road, 12°55'S, 143°00'E, Aug 1977, coll. Ingram & Hind, comm. Armitage 1138 (BRI,NSW); Walsh River, junction of Price Creek, Jun 1929, Tardent 166 (BRI).

Distribution: The species is evidently rare. It is known from only three localities. The population from which the type and fruiting material was collected is on a steep hillside in *Eucalyptus cullenii* woodland grading into *E. normantonensis* woodland. The Walsh River population has not been relocated despite more intensive botanical collecting in the area in the last few decades.

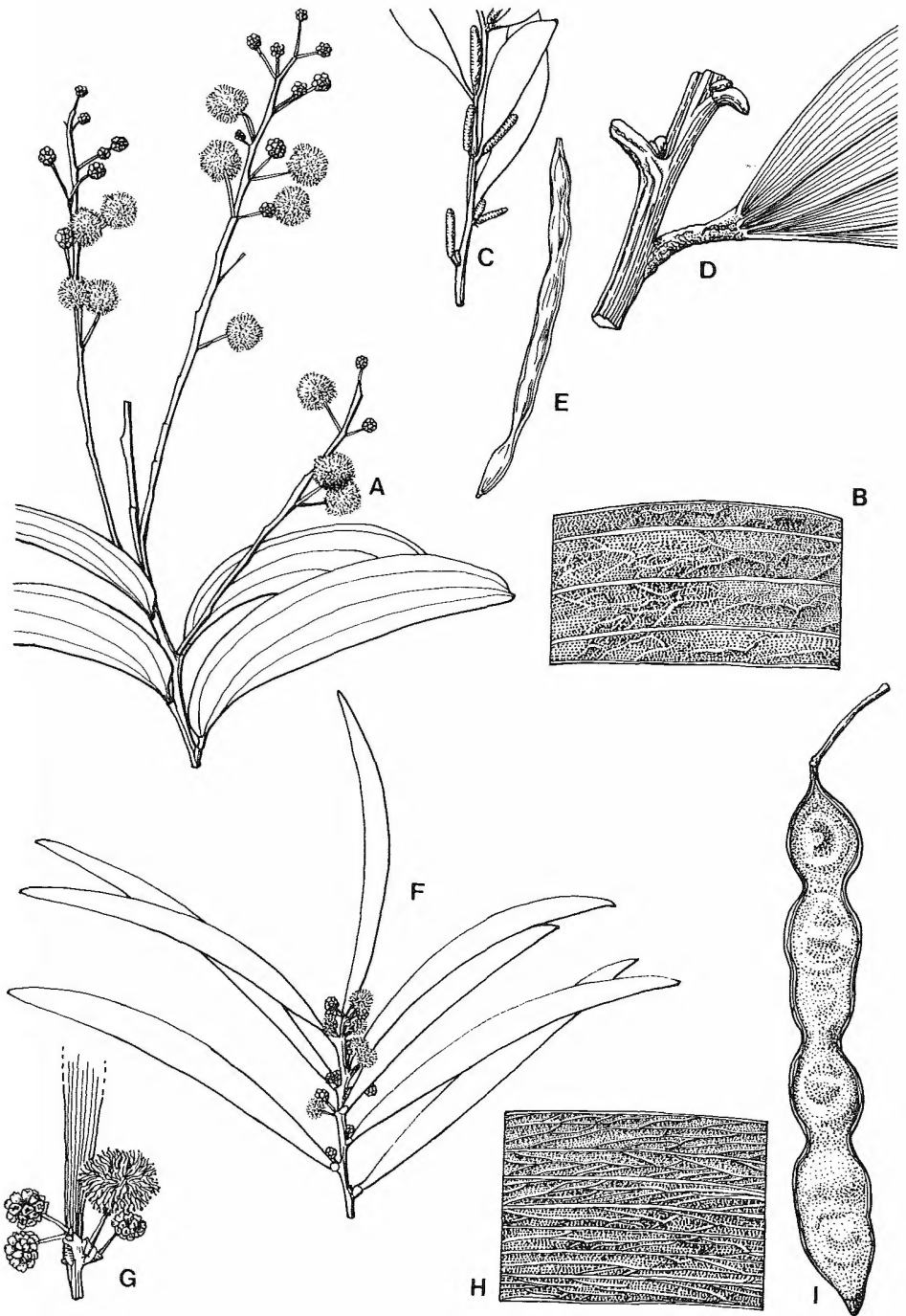


Fig. 1. *Racospermum paniculatum*: A. flowering branch $\times 2/3$. B. portion of phyllode $\times 2$. *R. meiospermum*: C. flowering branch $\times 2/3$. D. base of phyllode and pulvinus $\times 2$. E. pod $\times 1$. *R. armillatum*: F. flowering branch $\times 2/3$. G. inflorescence $\times 1$. H. portion of phyllode $\times 2$. I. pod $\times 1$.

Racosperma ommatospermum Pedley, *sp. nov.* ab *R. legnoto* (Pedley) Pedley phyllodiis minus manifeste nervatis minus falcatis leguminibus non alatis, seminibus parvioribus: ab *R. fleckeri* (Pedley) Pedley corollis longioribus, phyllodiis angustioribus, leguminibus angustioribus seminibus parum parvioribus et sine funiculo cingenti recedit. Typus: Andoom-Weipa area, 12°32'S, 141°55'E, Jun 1978, *K.A.W. Williams* 78088 (holo: BRI; iso: CANB).

A shrub or small tree, glabrous, branches drooping. Branchlets angular, soon becoming terete and ribbed. Phyllodes coriaceous, oblong-spathulate, somewhat falcate, the tip obtuse with a minute mucro, widest near the tip, narrowed to the base, 95–125 mm long, 7–12 mm wide, 9.5–14 times as long as wide, 3–5 ± prominent longitudinal nerves with oblique secondary nerves between them; gland small, without a rim, 1.5–3 mm from the base. Pulvinus 1.5–3 mm long. Heads of 25–30 flowers on axillary peduncles in one or two pairs in the upper axils, one head of each pair maturing before the other. Calyx lobes subacute, 0.8 mm long, united in the lower third, a few short hairs on the tube. Corolla lobes glabrous, 1.5 mm long, united to the middle. Stamens *ca* 3 mm long. Ovary glabrous but seen only in male flowers with a rudimentary style. Pod linear, glabrous with up to 12 seeds and 80 mm long, 6–8 mm wide, the valves raised over the seed alternately on each side. Seeds arranged longitudinally, lenticular, 3.3–3.5 mm diameter, 1.5–2 mm thick; pleurogram prominent with a pale line; areole closed or almost so; funicle with a small fold on one side of the seed, thickened from there to the hilar end into a distinct aril.

Specimens examined. Queensland. COOK DISTRICT: Andoom-Weipa area, 12°32'S, 141°55'E, Jun 1978, *Williams* 78088 (BRI,CANB.); Weipa, 12°39'S, 141°51'E, Oct 1981, *Morton* AM 1549 nursery raised stock (BRI,MEL); between 'York Downs' Stn and Coen, Oct 1979, *Scarth-Johnson* 873A (BRI).

Distribution: The species has a narrow range on Cape York Peninsula in the vicinity of Weipa where it occurs with *Eucalyptus tetrodonta* on red earth with ironstone gravel. It is evidently used to rehabilitate areas mined for bauxite at Weipa.

Racosperma fleckeri (Pedley) Pedley, *Austrobaileya* 2: 348 (1987).

Acacia fleckeri Pedley, *Austrobaileya* 1: 211 (1978).

Phyllodes straight 90–125 mm long, 13–40 mm wide, 2.8–10 times as long as wide. Pulvinus 2–6 mm long. Heads of 30–40 flowers on axillary peduncles up to 10 mm long in one or two pairs in the upper axils, one head maturing before other one of pair, but if two pairs then one of each pair maturing together. Calyx lobes narrowly oblong to 1.2 mm long, united only at base, widened to *ca* 0.4 mm and thickened at tip with minute hairs (*ca* 0.05 mm long). Corolla lobes united to the middle, 1.8 mm long with distinct midribs, thickened and minutely papillose at the tip. Stamens 3.5 mm long. Ovary glabrous. Pod with up to 12 seeds, to 120 mm long, 8–10 mm wide.

Specimens examined. Queensland. COOK DISTRICT: Weipa-Wheeler Creek, 12°30'S, 142°15'E, Sep 1980, *Godwin* A18 (BRI); on bank of Wenlock River [13°29'S, 141°50'E or 13°06'S, 142°57'E], Jun 1978, *Armitage* 1126 (BRI).

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NOTES ON SAPINDACEAE, V

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Summary

Two new species of *Diploglottis*, *D. berniana* and *D. obovata* and a new *Alectryon*, *A. ramiflorus* are described with notes on their distribution and relationship to the other species that occur in Australia. *Heterodendrum* Desf. is reduced to *Alectryon* Gaertn. and the new combinations *Alectryon diversifolius*, *A. tropicus*, *A. pubescens* and *A. oleifolius*, based on *Heterodendrum diversifolium* F.Muell., *H. tropicum* S.Reyn., *H. pubescens* S.Reyn. and *H. oleifolium* Desf., are made. Two new subspecies of *A. oleifolius*, subsp. *canescens* and subsp. *elongatus*, are described. *Alectryon semicinerus* (F.Muell.) Radlk. is removed from synonymy under *A. coriaceus* (Benth.) Radlk.

Contents

<i>Diploglottis</i> J.D.Hook.	328
<i>Alectryon</i> Gaertn.	332

Since publication of the reviews of *Diploglottis* J.D.Hook. (Reynolds 1981) and *Heterodendrum* Desf. and *Alectryon* Gaertn. (Reynolds 1983) and the account of Sapindaceae (Reynolds 1985), many more collections, some with better flowers or fruits, have become available. It is now possible to describe new species, amend some descriptions and keys, and reassess some generic and intraspecific distinctions.

DIPLOGLOTTIS J.D.Hook.

Diploglottis berniana S.Reyn., sp. nov. *D. cunninghamii* (Hook.) J.D.Hook. primo aspectu maxime simile quoad foliis et foliolis grandis sed ab ea differt essentialiter fructibus persaepe duplo majoribus, valvis crassioribus, floribus majusculis quinquepetalus. **Typus:** Cooper Creek, Parish of Alexandra, 16°10'S, 145°25'E, 24 Sep 1985, *B.Gray* 4159 (holo: BRI; iso: QRS); Portion 188, Parish of Alexandra, Palm Road, 17°11'S, 145°25'E, 27 Nov 1984, *B.Gray* 3730 (para: BRI; isopara: QRS) [this is a fruiting specimen.].

Trees to 20 m tall, to 20 cm girth; trunk fluted, buttressed. Young parts (especially young leaves), branchlets, leaf axes and peduncles red brown velutinous with pale or brown dense spreading hairs. Branchlets stout, fluted, 2–3 cm diameter at apex. Leaves (with petiole) 69–82(–90.5) cm long with 4 or 5 leaflets on each side of rachis. Petiole 12–20 cm long, subterete, broad and trisulcate at base. Rachis 34–48.5 cm long. Pinnae oblong or obovate-oblong or subelliptic (lowermost pair broadly obovate), apex truncate, rounded, obtuse or emarginate, margins slightly recurved, base truncate unequal, (9.5–)21–28(–32) cm × 7.5–15(–18) cm (juvenile leaflets 37 cm × 15 cm), shiny above, coriaceous, glabrous above except pubescent midrib, softly and sparsely villous below especially on nerves, midrib broad, densely villous; lateral nerves 18–25 pairs, patent, usually bullate between nerves, reticulation prominent. Petiolule 5–12(–15) mm long, pulvinate. Panicles 50–53 cm long, to 30 cm wide, cymes 2- or 3-flowered; bracts 3–10 mm × 1–8 mm, ovate, rusty brown velvety. Flowers 7–8 mm diameter; pedicel 3–5 mm long. Calyxes 5 mm × 8 mm, lobes ovate, 4–5 mm × 3–4 mm, tomentose. Petals 5, one slightly reduced, 3–4.5 mm × 2–3 mm, obovate, shortly clawed; scales densely woolly, hiding small fleshy crests. Disc incomplete, glabrous. Filaments 2–6.5 mm long, subulate, densely villous from middle to base. Ovary villous, style stout, 3 mm long. Fruit transversely ellipsoid with 2 divaricate lobes and aborted third lobe or subglobose and 1-lobed, slightly compressed at sutures, yellow, 3–3.5 cm × 3.2–4.2 cm; valves thick, fleshy, 8 mm thick, densely rusty pubescent outside, sparsely villous inside. Seed brown, 1.3 cm × 2.2 cm, smooth, ± laterally compressed; aril orange, nearly covering seed, Fig. 1.

Specimens examined. Queensland, COOK DISTRICT: T.R. 146 Tableland L.A., 15°43'S, 145°16'E, near Mt Amos, Sep 1980, *Hyland* 10574 (BRI); Alexandra Creek, 16°04'S, 145°21'E, *Webb & Tracey* 12180 (BRI); Cooper Ck, Parish of Alexandra, 16°10'S, 145°25'E, Sep 1984, *Gray* 4159 (BRI, QRS); portion 188, Parish of Alexandra, Palm

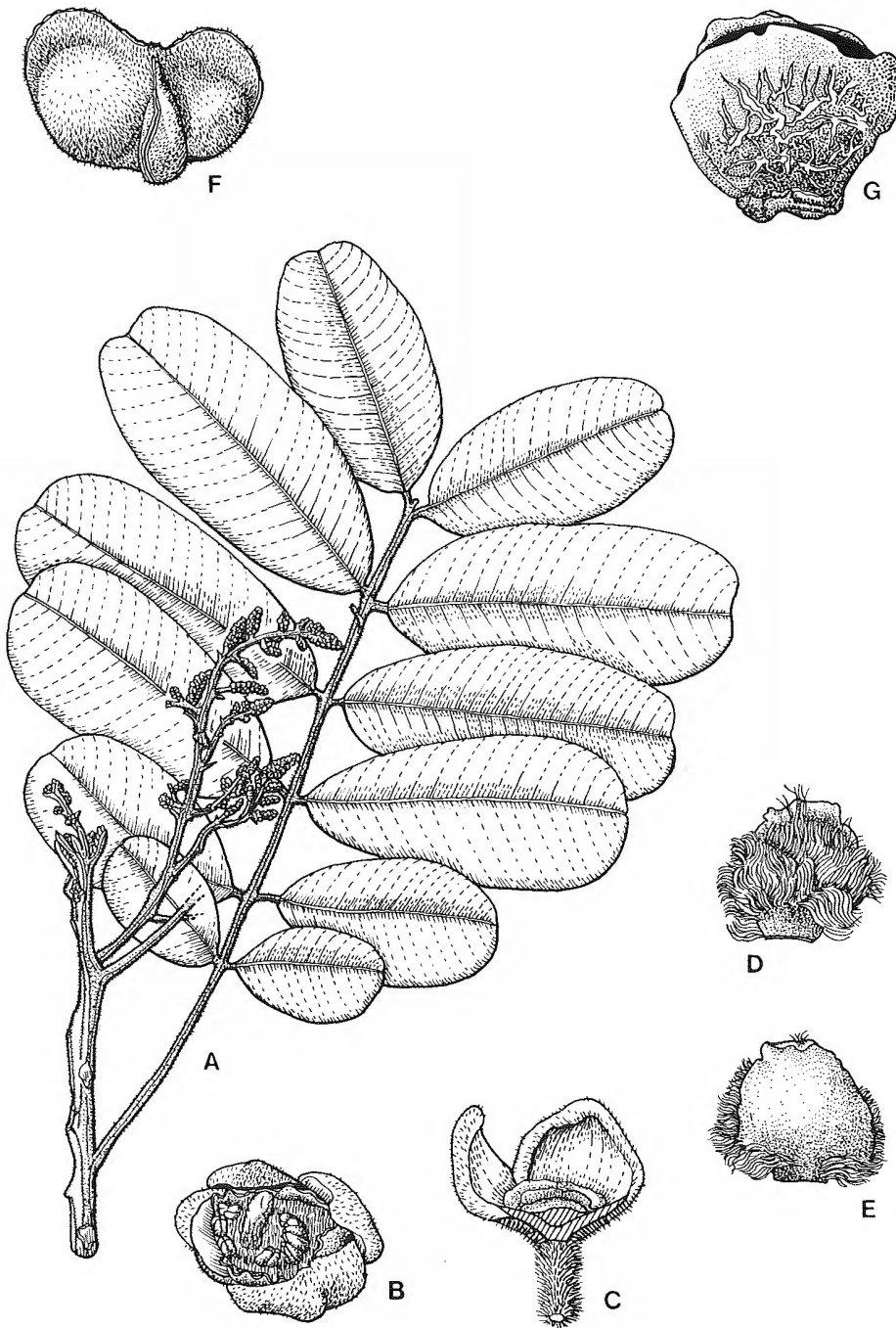


Fig. 1. *Diploglottis berniana*: A. habit with buds (Hyland 10574) $\times 1/5$. B. female flower (Gray 4159) $\times 4$. C. part of flower with petals and stamens removed to show calyx lobes and disc (Gray 4159) $\times 4$. D. front of petal showing hairy scales (Gray 4159) $\times 8$. E. back of petal (Gray 4159) $\times 8$. F. fruit (Gray 3730) $\times 1$. G. seed with aril (Gray 3730) $\times 2$.

Road, 17°11'S, 145°25'E, Nov 1984, *Gray* 3730 (BRI, QRS); S.F.R. 755 Barong L.A., 17°31'S, 145°50'E, near Russell River, Jul 1975, *Hyland* 3241(BRI), Oct 1976, *Hyland* 9158 (BRI), Jul 1978, *Hyland* 3692(BRI). [L.A. = Logging Area; S.F.R. = State Forest Reserve; T.R. = Timber Reserve]

Distribution and Habitat: North Queensland, from north of Rossville to Atherton Tableland, in rainforests, between 80 and 600 m altitude.

Affinities: The new species is at first sight similar to *D. cunninghamii* (Hook.) J.D.Hook. It has the large leaves and leaflets of *D. cunninghamii* but differs essentially in the large fruits with thick fleshy valves and larger flowers with five petals.

Etymology: The species is named in honour of Mr Bernie Hyland, CSIRO, Atherton, who first discovered the plant.

Diploglottis obovata S.Reyn., *sp. nov.* *D. diphyllostegia* (F.Muell.) Bailey aemulans differt essentialiter foliis 2- vel 3-jugis apicibus obtusis vel subrotundatis, nervis lateralibus numerosis inter se 4-7 mm distantibus. **Typus:** Queensland, NORTH KENNEDY DISTRICT: Dryander Creek about 2 km N of Gregory and about 20 km N of Proserpine, 10 Nov 1985, *P. Sharpe* 4169 (holo: BRI; iso: BRI).

Misapplied Name: *D. diphyllostegia* (F.Muell.) Bailey, in *Austrobaileya* 1(4): 397 (1981) quoad collections from Proserpine, Mackay and Bee Creek.

Small to medium sized spreading trees. Young parts, branchlets and leaf axes densely tomentose and finely villous with shiny $\pm$ crispate pale to brown-rusty hairs; young leaves sericeous. Branchlets slender, about 3 mm diameter at apex, lenticellate. Leaves (with petiole) 12-20(-25) cm long with 2 or 3 leaflets on each side of rachis. Petiole 2-4(-5.5) cm long. Rachis 1.5-7(-8.5) cm long. Pinnae obovate, elliptic to obovate-elliptic, apex obtuse or $\pm$ rounded, or truncate, base cuneate or obtuse, oblique, 5.5-12(-16.5) cm $\times$ 2.8-7 cm, glabrous above, finely puberulent below, midrib and nerves (below) finely pubescent, thinly coriaceous; lateral nerves 12-20 pairs, oblique, 4-7 mm apart (rarely more), parallel. Petiolule 3-7(-10) mm long. Panicles laxly branched, 7.5-19 cm long, to 10 cm wide, peduncles pale crispate tomentose, cymules 3-flowered; bracts 2.5 mm $\times$ 1 mm, brown velvety. Flowers 4-5 mm diameter, male and female on same inflorescence; pedicel 2-3 mm long. Calyces 3.5 mm $\times$ 4.5 mm, finely pale crispate tomentose outside, lobes 2-3 mm $\times$ 1-1.5 mm. Petals 5, one slightly reduced, 2.5-3 mm $\times$ 2 mm, obovate, claw short; scales longer than petal, densely woolly, mostly all crested. Disc incomplete. Stamens 8, filaments 3-4.5 mm long, pilose towards base. Fruit as in *D. diphyllostegia*, 1.4-1.6 cm $\times$ 1.4-3 cm, valves thin, finely pubescent outside, densely or sparsely hairy inside with long appressed pale hairs. **Fig. 2.**

Specimens examined (all BRI). Queensland. NORTH KENNEDY DISTRICT: Dryander Ck 4 km ESE of Mt Dryander, Jan 1986, *Guymer* 2007; Dryander Ck about 2 km N of Gregory and about 20 km N of Proserpine, Nov 1985, *Sharpe* 4169; Strathdiekie near Proserpine, Oct 1936, *McPherson* 90; Impulse Creek, Conway Range, Nov 1985, *Sharpe* 4068; Kelsey Ck near Proserpine, *Michael* 1134. SOUTH KENNEDY DISTRICT: Cathu S.F., Nov 1981, *Young* 429; Eungella Ra. via Mackay, Oct 1922, *Francis*; 29 km W of Mackay, Nov 1976, *Turner*. LEICHHARDT DISTRICT: Bee Creek, *Clemens* BRI 161710.

Distribution and Habitat: Queensland, Proserpine to Bee Creek SW of Sarina; usually on creek banks in notophyll vine forests.

Affinities: The new species is closely related to *D. diphyllostegia* (F.Muell.) Bailey under which it was included as an obtuse-leaved form (Reynolds 1981, pp. 397-398). It has the same characteristic flowers, fruits, leaf texture and colour of indumentum as *D. diphyllostegia* but differs essentially in the 2- or 3-paired leaflets, obtuse or subrotundate apices, oblique parallel lateral nerves close to each other, and finer, shorter hairs on the branchlets.

D. diphyllostegia (F.Muell.) Bailey has generally larger leaves, 16-43(-70) cm long with 3-6(-9) leaflets on each side of rachis; petiole 7-10 cm long; rachis 6.5-17(-26 in juvenile) cm long; pinnae elliptic oblong or subobovate, apex acute or acuminate (usually abruptly shortly acuminate) or obtuse, base subacute or obtuse, oblique, pubescent or puberulent below, 11.5-18.5(-23) cm $\times$ 4-7.5 cm, lateral nerves 10-14 pairs, (4-)7-15 mm apart; petiolule (2-)3-5 mm long. Panicles 15-29 cm long and as wide. *D. diphyllostegia* occurs in Queensland from Cape York Peninsula to near Ingham, usually on creek or river banks in mesophyll rainforest, and in Papua New Guinea.

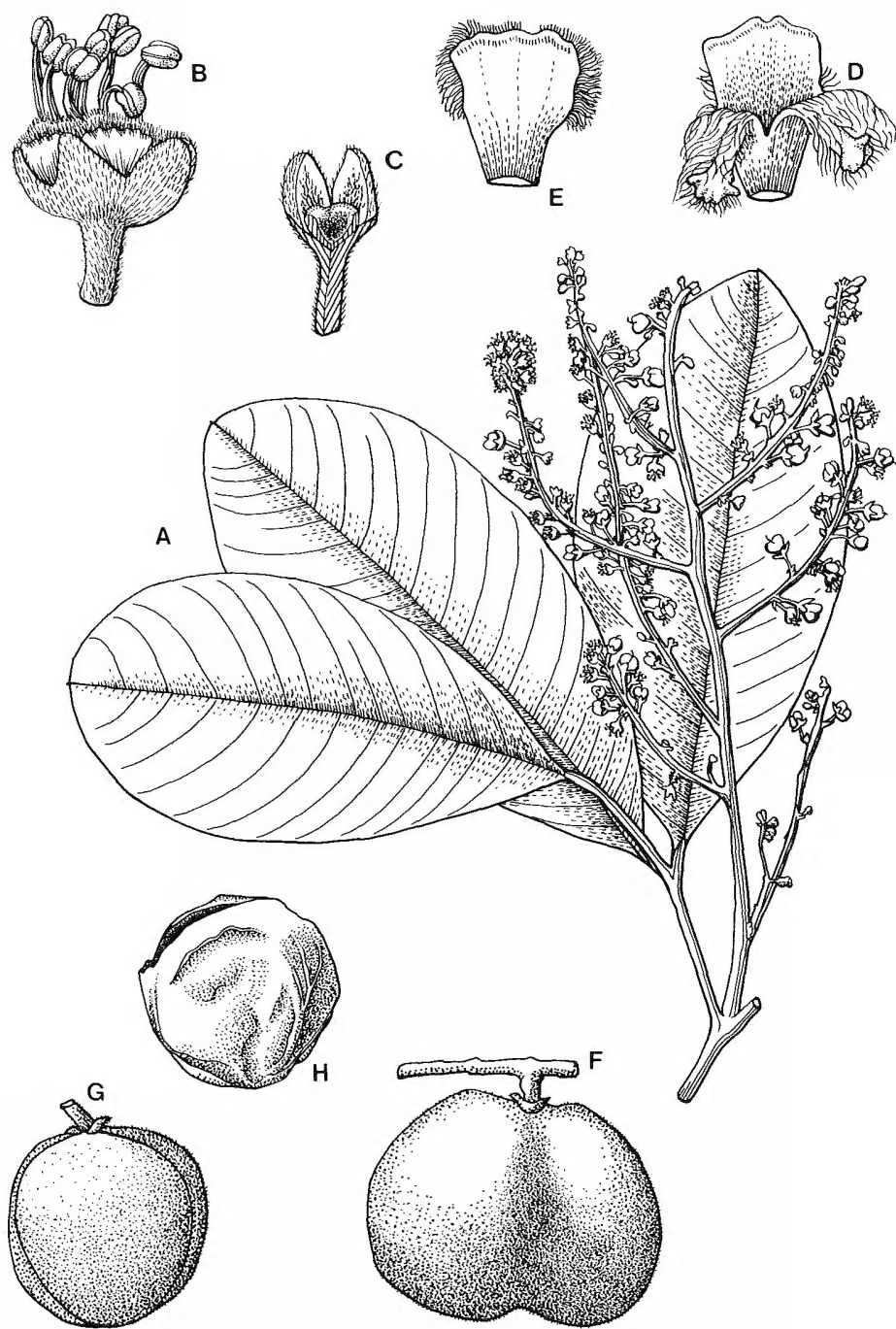


Fig. 2. *Diploglottis obovata*: A. habit with flowers (Young 429) $\times 3/4$. B. male flower (Young 429) $\times 6$. C. Calyx lobes (Young 429) $\times 6$. D. front of petal showing scales and crests (Young 429) $\times 12$. E. back of petal (Young 429) $\times 12$. F & G. fruits (Michael BRI 161706) $\times 2$. H. seed with aril (Michael BRI 161706) $\times 2$.

In the key to the species of *Diploglottis* (Reynolds 1983, p. 391) couplets 6 and 7 must be replaced by the following:

6. Leaf rachis 10–48.5(–71) cm long. Petiole (5–)8–17(–27) cm long. Leaflets 9–33(–51) cm × 5–15(–18) cm, rarely smaller. Petiolule (2–)7–35 mm long 7
- Leaf rachis 1.5–17(–26) cm long. Petiole 2–8(–10) cm long. Leaflets 5.5–18.5(–23) cm × 2.8–7.5 cm. Petiolule 2–7(–10) mm long 9
7. Petiolule (7–)11–35 mm long. Inflorescence unbranched, arrow. Flowers 7–8 mm diameter. Leaflets obtuse or abruptly acuminate. Shrubs or small trees to 4 m, unbranched **D. macrantha**
(Cape York Peninsula, Qld)
- Petiolule 2–12(–15) mm long. Inflorescence branched, usually nearly as wide as long. Flowers 4–8 mm diameter. Leaflets usually broad, obtuse or truncate at apex. Trees to 35 m, branched 8
8. Fruit thin-walled, 1.3–1.8 cm × 2.5–3 cm. Petals 4, rarely with reduced 5th one. Flowers 4–6 mm diameter. Rachis 10–35(–71) cm long. Petiole 5–11 cm long. Basal leaflets oblong to oblong-obovate **D. cunninghamii**
(S.E. Qld & N.S.W.)
- Fruit thick-walled, 3–3.5 cm × 3.2–4.2 cm. Petals 5. Flowers 7–8 mm diameter. Rachis 34–48.5 cm long. Petiole 12–20 cm long. Basal leaflets broadly obovate **D. berniana**
(N. Qld)
9. Leaflets 3–5-paired, acuminate, acute or obtuse; lateral nerves not close together (to 15 mm apart). Rachis 6.5–17(–26) cm long. Branchlets densely hairy, with long usually coarse spreading hairs and pale tomentum **D. diphylostegia**
(N. Qld & New Guinea)
- Leaflets 2–3-paired, obtuse or subrotundate at apex; lateral nerves close together (usually less than 7 mm apart). Rachis 1.5–3.2 cm long. Branchlets finely tomentose with crispate, appressed and spreading hairs **D. obovata**
(Proserpine to Eungella, Qld)

ALECTRYON Gaertn.

Alectryon ramiflorus S.Reyn., **sp. nov.** a speciebus ceteris Australiensis foliolatis parvioribus angustis pluribus (plerumque 6–9 paribus) polymorphis in juvenalis praecipue differt, et inflorescentiis ramifloris fructuosis. **Typus:** Queensland, Wide Bay District: Cordalba State Forest, south of Bundaberg, 27 Jan 1986, *K.D.Sarnadsky & E.E.Zillmann* 351 [fruiting specimen] (holo: BRI; iso: BRI).

Tree to 7 m, older branches with numerous prominent ellipsoid lenticels. Young branches and leaf axes with scattered ascending appressed or spreading pale brown hairs. Leaves polymorphic, with (2–)6–9 leaflets on each side of rachis (12–19 in juvenile leaves). Petiole (1–)2.5–4.5 cm long, subterete, shortly pulvinate. Rachis 3–12.5 cm long (19 cm in juveniles) adaxially ridged, usually slightly margined. Leaflets polymorphic, subopposite or alternate, variable, usually narrowly elliptic or subovate, apex truncate or obtuse, retuse, margins entire or with few lobes, base acute or abruptly attenuate and decurrent into petiolules, oblique, 2.2–6.7 cm × 0.6–1.5 cm, thinly coriaceous, pale green and ± shiny above, yellow green below, glabrous or with few hairs on midrib and towards the base below; midrib ridged above, lateral nerves and reticulation prominent, fine, lateral nerves 8–12 pairs subpatent. Petiolule 2–7 mm long. (Juvenile leaflets with lobes or pinnately divided into fine narrow leaflets, leaves bipinnate in adventitious shoots.)



Fig. 3. *Alectryon ramiflorus*: A. habit with fruits (Sarnadsky & Zillmann 351) $\times 3/4$. B. fruit $\times 4$. C. seed with aril $\times 4$.

Inflorescences clustered on branches on short brachyblast-like structures sometimes intermingled with young shoots, usually 2–4(–7) per cluster, paniculiform with few lax branches, usually branching from the base, 9–13 cm long and as wide, secondary and tertiary peduncles slender, puberulent. Flowers 3–3.5 mm diameter; pedicels 1.5–2 mm long. Calyces broadly cupular, 2 mm $\times$ 3–3.5 mm, lobes small, ovate, 0.7 mm $\times$ 1 mm, puberulent. Petals absent. Disc fleshy, crenulate. Stamens 6–8, filaments 1 mm long, glabrous, anthers 2 mm long. Ovary (1–)2-lobed. Fruit green, small, usually borne in a dense mass, (1–)2-lobed, broadly and transversely ellipsoid with 2 globose or ellipsoid turgid lobes slightly compressed at apex, 5–6 mm $\times$ 9 mm, if 1-lobed then subglobose or ellipsoid and 7 mm $\times$ 4 mm; pericarp thinly fleshy, drying $\pm$ crustaceous, glabrescent or glabrous outside. Seeds brownish, half enclosed in red granular cupular aril; stalk 5 mm long, slender. **Fig. 3.**

Specimens examined. Queensland, WIDE BAY DISTRICT: Cordalba, April 1982, *Sarnadsky* 168 (BRI); Cordalba State Forest, south of Bundaberg, Jan 1986, *Sarnadsky & Zillmann* 351 (BRI), Dec 1986, *Zillmann* (BRI) [flowering specimen].

Distribution and Habitat: Known only from type locality in southern Queensland. Rare, growing in a small population of about 20 specimens in remnant scrubs.

Affinities: A very distinctive species differing from all the other species of *Alectryon* known from Australia by the inflorescences clustered on old branches and the very variable and polymorphic leaves and leaflets especially in juvenile and adventitious shoots. Leaflets are also smaller, narrower and greater in number (usually 6–9 pairs) than in other species.

Note: The mass of fruit on the branches was said to be so dense that it obscured about a 60 cm long portion of each branch. The wood is reported to be suitable for turning.

Alectryon Gaertn. and *Heterodendrum* Desf.

The finding of *A. ramiflorus* S.Reyn. has necessitated a reassessment of the variability and relationships of *Alectryon* Gaertn. and *Heterodendrum* Desf. In the past they have been separated on their leaf character, pinnate in *Alectryon* and simple in *Heterodendrum*. Apart from this they are hardly distinguishable, having similar flowers and fruits, seeds and arils. For example, fruits of *H. oleifolium* Desf. resemble those of *A. coriaceus* (Benth.) Radlk. and *A. repando-dentatus* Radlk., while those of *H. pubescens* S.Reyn. are hardly distinguishable from those of *A. subdentatus* (F.Muell. ex Benth.) Radlk. *H. pubescens* closely resembles *H. diversifolium* F.Muell. in having entire or lobed leaves. Both can have leaves lobed or entire in the upper part and pinnate at the base. In this character they resemble *A. subdentatus* to such an extent that *A. subdentatus* has sometimes been thought to be an abnormal form or a hybrid with *H. pubescens*. Dr P.W.Leenhouts, Leiden, who is currently working on *Alectryon* suggested (in litt.) the transfer of *H. pubescens* to *Alectryon*. However it is closely related to *H. diversifolium* and has the inflorescence of *Heterodendrum*.

The small fruits and the shape and lobing of the leaves of *A. ramiflorus* resemble those of species of *Heterodendrum*. In this species leaflets of the same leaf can be entire, lobed or pinnate and on adventitious shoots the leaves are bipinnate with fine narrow leaflets, a condition not before seen in Australian Sapindaceae. Most species in this family develop simple leaves first (seedling stage), then lobed leaves (usually in juveniles), and finally pinnate leaves, for example, *Atalaya*, *Diploglottis* and *Harpullia*. Species of some genera, for example, *Atalaya* and *Dodonaea* have either simple or pinnate leaves. Leaves of *Atalaya variifolia* F.Muell. ex Benth. can be simple, lobed or pinnate, sometimes on a single branch. Because of the variability of the leaves of *Alectryon* and *Heterodendrum*, the occurrence of simple lobed and pinnate leaves in species of other genera of Sapindaceae, and the lack of other distinguishing characters, the two genera are combined here under the earlier name, *Alectryon*.

The distribution of *Alectryon*, including *Heterodendrum* is similar to some other genera such as *Flindersia*. Species of *Alectryon* as formerly defined are mostly found in rainforests while those of *Heterodendrum* are found in drier areas, for example, in brigalow communities. *H. oleifolium* extends to the margins of deserts.

New combinations for species previously under *Heterodendrum*1. *Alectryon diversifolius* (F.Muell.) S.Reyn., comb. nov.

Heterodendrum diversifolium F.Muell., Fragm. 1: 46 (1858). Type: subtropical and tropical eastern Australia, Brigalow scrubs, collector unknown (not seen).

2. *Alectryon tropicus* (S.Reyn.) S.Reyn., comb. nov.

Heterodendrum tropicum S.Reyn., *Austrobaileya* 1: 484 (1983). Type: COOK DISTRICT: Mungana, 16 Jun 1946, H.Flecker N.Q.N.C. No 10423 (BRI: holo).

3. *Alectryon pubescens* (S.Reyn.) S.Reyn., comb. nov.

Heterodendrum pubescens S.Reyn., *Austrobaileya* 1: 485 (1983). Type: BURNETT DISTRICT: Eidsvold, Sep 1915, Dr T.L.Bancroft (BRI: holo).

4. *Alectryon oleifolius* (Desf.) S.Reyn. comb. nov.

Heterodendrum oleifolium Desf., Mem. Mus. Hist. Nat. 4: 8.t.3 (1818). Type: Western Australia, probably Shark Bay area, Baudin expedition (? iso: fragments and negatives NSW, photo BRI).

The variability of *Alectryon oleifolius* (Desf.) S.Reyn.

Alectryon oleifolius (Desf.) S.Reyn. is a very variable and complex species with two other species reduced under it, namely *H. macrocalyx* Radlk. and *H. microcalyx* Radlk. These were previously treated as varieties (Reynolds 1983, 1985). Recent numerous additions to collections of this widespread species have necessitated the reassessment of this complex. It was found that differences between the three varieties were far greater than thought previously. Three quite distinct entities can now be segregated morphologically and supported to a certain extent by ecological and distributional differences. The entities only connect with each other through a small proportion of specimens with somewhat intermediate characters. As these entities are not specifically distinct, as Radlkofer (1879) had thought, and there is also a slight overlap in ecology and distribution, the varieties are here raised to subspecific rank. Necessary new combinations are made and the key in Reynolds 1983, p.483 is amended as indicated below. Some variation does occur in the subspecies and further collections may prove them to be distinct varieties but varietal status is not warranted at the present time.

The epithets '*macrocalyx*' and '*microcalyx*' have been discounted in the choice of subspecific epithets as the size of the calyx varies in the same subspecies. Indumentum, leaf and inflorescence characters and the length of pedicels are used to separate the subspecies.

1. Leaves 1.2–2.7 cm wide, rarely less; length: breadth ratio 2.3–5(–6):1; lamina obovate or elliptic, obtuse truncate, retuse or subacute. Fruits hairy 2
- Leaves less than 1 cm wide; length: breadth ratio 7–20(–31):1; lamina usually long and slender, narrowly elliptic or subobovate, acute, acuminate or obtuse. Fruits hairy or glabrous 3
2. Leaves and branches rigid, canescent or glabrous. Cymules sessile or subsessile, flowers on stout pedicels 1–2(–4) mm long. Flowers red. Aril orange subsp. *oleifolius*
- Leaves and branches usually drooping, canescent. Cymules and flowers on slender stalks 3–14 mm long. Flowers greenish or yellowish. Aril red subsp. *canescens*

3. Fruit, calyx and leaves usually densely hairy. Leaves narrowly elliptic or subobovate, length:breadth ratio 7.5–10.6(–12):1. Inflorescences 1–13-flowered, of cymes, racemes or panicles. Flowers to 6 mm wide; pedicels (3–)6–14 mm long subsp. **canescens**

Fruit, calyx and leaves usually glabrous. Leaves usually slender and long, length:breadth ratio 7–20(–31):1. Inflorescences to 53- or more-flowered, usually panicles. Flowers 2.5–4 mm wide; pedicels 1.5–4(–6) mm long subsp. **elongatus**

Alectryon oleifolius (Desf.) S.Reyn. subsp. **oleifolius** stat.nov.

Heterodendrum oleifolium Desf., Mem. Mus. Hist. Nat. 4: 8.t.3 (1818). **Type:** Western Australia, probably Shark Bay area, *Baudin expedition* (iso: fragments and negatives NSW, photo BRI).

H. oleifolium var. *oleifolium* S.Reyn., *Austrobaileya* 1: 483 (1983).

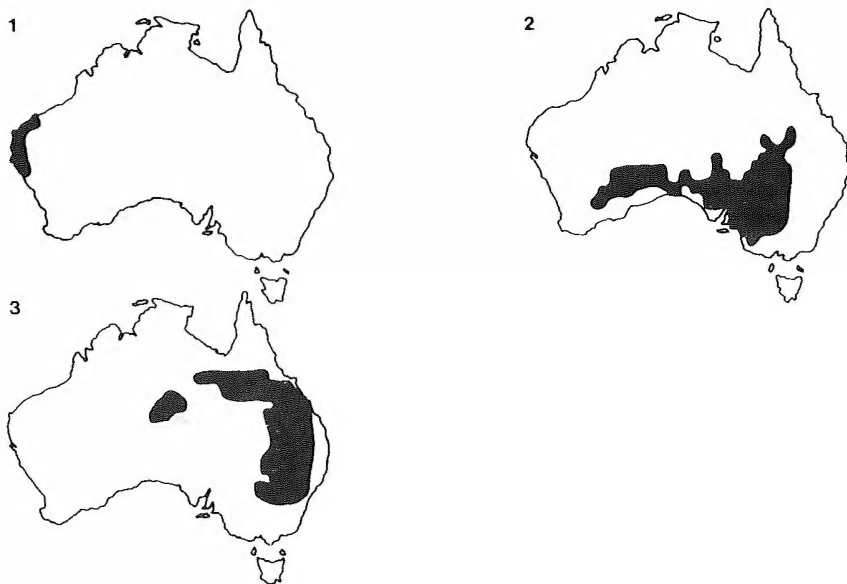
H. oleifolium var. *euryphyllum* Domin, *Biblioth. Bot.* 89: 348 (1927). **Type:** Hamersley Range near Nichol Bay, W.A., *F.Gregory's Exped.* (not seen).

Shrubs or small trees to 3 m high, 5 m wide, sometimes spinescent. Leaves glaucous or green, truncate, retuse or obtuse, 3.5–8(–10.5) cm × 0.7–2.7 cm. Petiole 4–10 mm long. Inflorescence racemiform or with racemiform branches. Calyx 3–6 mm wide, entire or subentire. Fruit 2- or 3-knob-lobed, to 2.2 cm diameter.

Distribution and Habitat: Western Australia. North West District: Hamersley Range to Tamala Station near Shark Bay; on red sand hills or grey sandy clay. **Map 1.**

Common name: Minga tree.

Notes and Observations: The stiff leaves and inflorescence with subsessile- or sessile cymules and red flowers on stout ± patent pedicels distinguish this subspecies.



Maps 1–3. 1. *Alectryon oleifolius* subsp. *oleifolius*. 2. *A. oleifolius* subsp. *canescens*. 3. *A. oleifolius* subsp. *elongatus*.

Alectryon oleifolius (Desf.) S.Reyn. subsp. **canescens** S.Reyn., **subsp. nov.**

Heterodendrum macrocalyx Radlk., Act. Congr. Bot. Amsterdam 119 (1877); = Sapind. Holl.-Ind. 49 (1879). **Type:** Murray River, *collector unknown* (syn: not seen); between Ooldea and Charlotte Waters, *collector unknown* (syn: not seen).

H. oleifolium Desf. var. *macrocalyx* (Radlk.) Domin, Biblioth. Bot. 89: 348 (1927).

Shrubs or small trees to 6 m; branchlets, leaves and inflorescences densely white hairy. Leaves sericeous when young, obovate or elliptic, 5–8.5(–10) cm × 0.4–1.6(–2.2) cm, obtuse, acute or subacute mucronate; petiole 2–16 mm long. Flowers solitary or in a few 3–9(–13)-flowered cymes, racemes or panicles. Calyx usually 4–6 mm wide, subentire. Fruit (1–)2- or 3-lobed, densely hairy, 1.2–2.5 cm diameter.

Distribution and Habitat: Common form in inland regions of Western Australia, South Australia, north-western New South Wales, Victoria and western Queensland; on sand dunes, sandy ridges and hills, and creekbanks. **Map 2.**

Common name: Bullock Bush, Black Apple Bush, Dogwood, Rosewood, Cabbage Bush.

Aboriginal name: Mindra.

Etymology: The subspecific epithet refers to the canescent look of the plants.

Notes and Observations: This subspecies differs from the typical one in the pedicels tending to be long and slender whereas in subsp. *oleifolius* they are short and stout. The leaves and tips of branches droop in this subspecies.

Alectryon oleifolius (Desf.) S.Reyn. subsp. **elongatus** S.Reyn., **subsp. nov.**

Heterodendrum microcalyx Radlk., Act. Congr. Bot. Amsterdam 119 (1877); = Sapind. Holl.-Ind. 49 (1879). **Type:** Flinders River, *collector unknown* (holo: MEL).

H. oleifolium var. *microcalyx* (Radlk.) Domin, Biblioth. Bot. 89: 348 (1927).

H. floribundum Pritzel in Fedde, Repert. 15: 358 (1918). **Type:** Central Australia, Hermannsburg at Finke River, *Strehlow* 43 (not seen).

Small trees to 13 m; tips of branches and leaves usually drooping. Branchlets, leaves and calyces puberulent or glabrous. Leaves light green, slender and long, narrowly elliptic, subfalcate, acute, acuminate or obtuse, (4–)5.7–15.5(–18) cm × 0.4–1(–1.8) cm; petiole 5–15 mm long. Inflorescence racemiform or densely flowered panicles, 5–53(–100)-flowered. Calyx 2.5–4 mm wide, subentire or lacinate. Fruit obcordate or didymous with divaricate lobes, 1.2–2.5 cm diameter, glabrous.

Distribution and Habitat: North-western Queensland, southern central Australia and to near Wyalong, New South Wales; in open forests usually on heavy soils. **Map 3.**

Common name: Boonaree, Australian Rosewood, Western Rosewood.

Etymology: The subspecific epithet refers to the slender long leaves.

Notes and Observations: This subspecies is distinctive in having glabrous fruits, green leaves and densely flowered inflorescences with small flowers.

Some collections from Northern Territory differ slightly in having wider leaves and very short dense inflorescence and laciniately lobed calyces. They were described as *H. floribundum* Pritzel, and have characters of both other subspecies. Further collections may prove it to be a distinct taxon, the collections seen so far are insufficient to form an opinion.

***Alectryon coriaceus* (Benth.) Radlk. and *A. semicinereus* (F.Muell.) Radlk.**

The status of these two closely related species which were combined in the review of *Alectryon* by Reynolds (1983) is here reassessed in view of recent collections and the two species are shown to be distinct.

When the genus was reviewed *A. semicinereus* was known from only one poor collection from north Queensland (*Volck* 1414) apart from the type and some cultivated specimens at QRS. It was not unlike some of the collections of *A. coriaceus* from south-

eastern Queensland so that it was thought to be an acute-leaved form of *A. coriaceus* and placed under that species. Both species have similar leaves, with greyish lower surfaces of leaflets, and the same indumentum, inflorescences, flowers and fruits.

Recent additions to the collections from north Queensland show that the leaves of these specimens are distinct from those from south-eastern Queensland. Since the two species also differ ecologically, *A. semicinerus* is now considered to be a species distinct from *A. coriaceus*.

The key to the species (Reynolds 1983, pp. 472–473) should be amended. Delete '*A. coriaceus*' from the first lead of Couplet 3 and substitute '3a'. Add the following Couplet 3a.

3a Leaflets 1-paired, rarely 2-paired, elliptic-oblong or obovate-oblong, broad, rounded or obtuse at both ends, 5.5–13.5 cm × 2.5–7.5 cm; lateral nerves 8–12 pairs. Petiolule short and stout, 3–5 mm long. ***A. coriaceus***

Leaflets 2- or 3-paired, rarely 1- or 4-paired, elliptic-oblong, narrowing and pointed at both ends, acute or acuminate, 9–19 cm × (4–)5.7–8.5 cm; lateral nerves 10–18 pairs. Petiolule slender, pulvinate, 6–17 mm long ***A. semicinerus***

Allectryon coriaceus (Benth.) Radlk., Act. Congr. Bot. Amsterdam 118 (1877), = Sapind. Holl.-Ind. 48 (1879).

Distribution and Habitat: Grows in sublittoral forests, on coastal sands from Maryborough, Queensland, to Port Stephens, New South Wales.

Allectryon semicinerus (F.Muell.) Radlk., Act. Congr. Bot. Amsterdam 118 (1877), = Sapind. Holl.-Ind. 48 (1879).

Distribution and Habitat: Grows in moist or subtropical rainforests in Queensland from the Atherton Tableland to Bulburin usually on basalt. Its distribution is as follows:

COOK DISTRICT: S.F. 191 [not S.F.R. 91 as labelled], Wongabel, S of Atherton, Jul 1959, *Volck* 1414 (BRI); S.F.R. 194, Parish of Barron, Carrington Rd, Jan 1985, *Gray* 3830 (QRS); Apr 1985, *Gray* 3996 (QRS); R. 1173, banks of the Barron River approx 1 km downstream from Atherton–Yungaburra bridge, Mar 1982, *Tracey* 14925 (QRS); Kirrama S.F. near Kennedy, Jan 1985, *Crowley* (QRS); S.F.R. 607, Parish of Dinden, Bridle L.A., May 1985, *Gray* 4034 (QRS). PORT CURTIS DISTRICT: Bulburin S.F. 67, Jul 1985, *McDonald* 4076 (BRI), May 1986, *Gibson* 804 (BRI). [S.F. = State Forest; S.F.R. = State Forest Reserve; R. = Reserve; L.A. = Logging Area]

Acknowledgements

This is the final of the series of the study in Australian Sapindaceae, the completion of which would not have been possible without the assistance I have received. I would like to acknowledge my thanks to Les Pedley for his guidance and for providing or checking the latin diagnoses. My thanks are also due to Dr Bob Johnson and Rod Henderson for their help and comments. I am grateful to Laurie Jessup, Bill McDonald, Gordon Guymer, Trevor Stanley, Norm Byrnes, Bernie Hyland, Geoff Tracey, Philip Sharpe, Jeny Calway, Bruce Gray, John Clarkson, Bob Jago, Andrew Graham, John Connors, Lloyd Bird and Aileen Wood for their comments or assistance, especially in providing essential specimens. I extend my thanks to the directors or keepers of the following herbaria for kindly loaning me their specimens for study, QRS, MEL, NSW, AD, PERTH, DNA, K, BM, A, L and PR.

This study has been based mainly on collections housed at BRI and QRS.

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TWO NEW SPECIES OF *NOTELAEA* VENT. (OLEACEAE) FROM SOUTH-EASTERN QUEENSLAND

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Summary

The new species *Notelaea pungens* and *N. lloydii* are described and illustrated.

During a collecting trip to the Barakula State Forest in November 1981, I collected fruiting material of a species of *Notelaea* which was unknown to me. Later examination of this material revealed that it represented a new species. However, I required flowering material to complete the study. This material has recently been obtained through the generous assistance of Mrs Val Hando of Chinchilla and enables the species to be formally described.

The second *Notelaea* species described in this paper was brought to my attention by Mr L.H. Bird of Bundamba who first collected material of it in 1981. Subsequent collections by him and examination of populations in the field have confirmed that it, too, is a new species.

Floral descriptions of the two new species are based on material preserved in spirit.

***Notelaea pungens* Guymer, sp. nov.** affinis *N. lineari* Benth. sed foliis brevioribus pungentibus (1.1–3.2 cm longis), inflorescentiis 1-floribus et pedicellis brevioribus (0.5–0.6 mm longis) differt. **Typus:** Queensland, Darling Downs District: Percy Grant Road, Barakula State Forest, 15 Jun 1985, V. Hando 378 (holo: BRI; iso: BRI, CANB, MEL, NSW).

Compact small bushy shrubs 15–60 cm high. Branchlets puberulent with erect simple hairs, glabrescent. Leaves glabrous except for basal part of midrib above and petioles; lamina coriaceous, lanceolate, acute, slightly punctate above, less so below, 1.1–3.2 cm long, 4–5 mm wide; margin entire, thickened and slightly recurved; apex aristate; base attenuate into petiole; venation obscure above and below, visible with lens, lateral veins 7–9 pairs; petiole sparsely puberulent, to 1 mm long. Inflorescences axillary, 1 (or 2) per axil, metaxymonads, 2–3 mm long; axes puberulent; bracts 4–8, decussate; ovate, puberulent outside, margins ciliolate, persistent, 0.4–0.6 mm long. Flowers very pale green to pale yellow; pedicels sparsely puberulent, articulate at base, 0.5–0.6 mm long. Sepals semi-elliptic, apex acute, sparsely puberulent, margins ciliolate, 0.6–0.8 mm long. Corolla induplicate-valvate in bud, 4(–5)-lobed; lobes ovate, concave, usually in pairs, 1.9–2.5 mm long, 0.9–1.1 mm wide, joined above the base of filaments for 0.3–0.5 mm, margins ciliolate. Stamens 2, glabrous, enclosed within the concave corolla lobes; filaments 0.4–0.6 mm long with a broad connective and small terminal umbo; anthers 1.2–1.3 mm long, 1.1–1.2 mm wide. Ovary glabrous, 1–1.6 mm long at anthesis; style 0.3–0.4 mm long; stigma cream, 2-lobed, 0.3–0.4 mm long. Drupe globular to ovoid, dark blue, 7–10 mm long, 5–9 mm diameter; mesocarp 1–1.2 mm thick; endocarp crustaceous, 0.1–0.25 mm thick. **Fig. 1.**

Specimens examined. Queensland, DARLING DOWNS DISTRICT: N side of Big Break, between Barakula Office and Bollon Office, 2 km E of Burncluith road, Barakula State Forest, Mar 1985, *Ballingall* 1756 (BRI); Percy Grant road, Barakula State Forest, Mar 1985, *Ballingall* 1757 (BRI), June 1985, *Hando* 378 (BRI, CANB, MEL, NSW); 2 km S of Percy Grant Road, 26°23'S, 150°45'E, Barakula State Forest, May 1986, *Ballingall* 2202 (BRI); Mothers Day patch [26°24'S, 150°45'E], Barakula State Forest, Nov 1981, *Guymer* 1630 (BRI).

Distribution: *N. pungens* is known only from a small area within Barakula State Forest, north of Chinchilla.

Ecology: The species occurs in open eucalypt forests of *E. watsoniana* F.Muell. and *E. panda* S.T.Blake on soils derived from sandstone.

Flowering period: May to July.

Fruiting period: November to March.

Notes: *N. pungens* will key to *N. linearis* in Green's (1968) revision of *Notelaea* and in the Flora of South-eastern Queensland (Stanley & Ross 1986) but differs in its 1-flowered inflorescences, short pedicels (0.4–0.5 mm long) and pungent leaves.

Conservation status: The species is assessed as restricted and vulnerable (2V) using the risk coding of Leigh, Briggs and Hartley (1981).

Etymology: Named from the Latin *pungens* in reference to the sharp-pointed leaves.

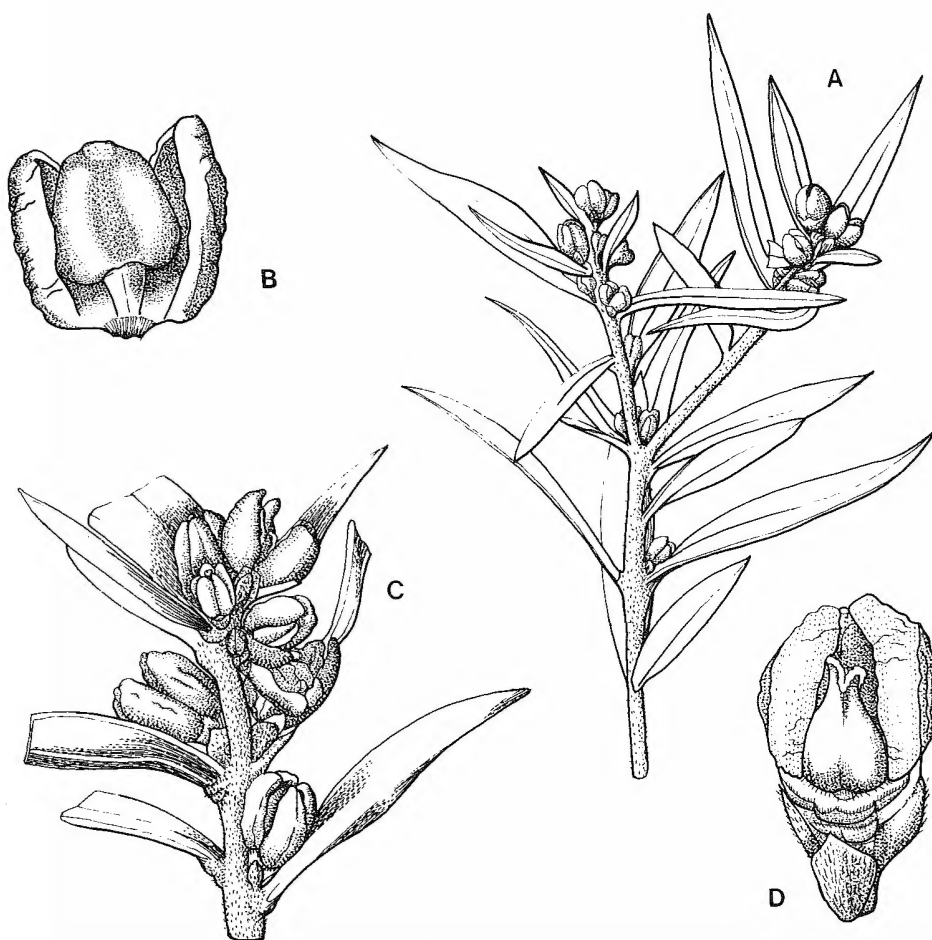


Fig. 1. *Notelaea pungens*: A. flowering branchlet $\times 3$. B. stamen and two corolla lobes $\times 12$. C. inflorescence $\times 6$. D. flower with front two corolla lobes removed showing ovary $\times 12$. All from Hando 378.

Notelaea lloydii Guym. *sp. nov.* affinis *N. microcarpa* R.Br. sed foliis perangustis verruculosi, inflorescentiis 5–9 floribus et habitu multicauli differt. **Typus:** Queensland, Moreton District: End of Bunya Street, off Mt Crosby road, 13.8 km W of Kenmore P.O., Jul 1985, *G.P. Guym. 1990* (holo: BRI; iso: AD,BRI,CANB,DNA,K,L,MEL,MO,NSW,PERTH).

Multistemmed shrubs, 1–3(–4) m high; stems 2–4 cm diameter; bark pale grey, smooth. Branchlets puberulent with erect simple hairs, glabrescent. Leaves glabrous except puberulent base; lamina coriaceous, linear, slightly falcate, punctate above and below, 7–14 cm long, 2–5.5 mm wide (length:breadth ratio 30–72:1); margin entire, slightly raised and recurved; apex acute; base very narrowly cuneate, decurrent into petiole; venation distinct and raised above, obscure and flush below, lateral veins 9–12 pairs; petioles puberulent, 1–2 mm long. Juvenile leaves linear, 6–15 cm long, 1–2 mm wide. Inflorescences axillary, 1 or 2 per axil, metabotryoids, 5–9-flowered, 5–10 mm long; axes puberulent, sometimes glabrous apically; upper bracts ovate or lanceolate, caducous, sparsely puberulent outside, glabrous inside, 0.8–1.2 mm long, basal pair ovate-acute, puberulent outside, persistent, 1–1.5 mm long. Flowers pale yellow or cream; pedicels glabrous or sparsely puberulent, articulate at base, 3–5 mm long. Sepals glabrous or ciliolate at apex, triangular, apex acute or rounded, 0.2–0.6 mm long, 0.4–0.8 mm wide. Corolla induplicate-valvate in bud, 4-lobed; lobes ovate, concave, 0.9–2.2 mm long, 0.9–1 mm wide, joined in pairs above base of filament for 0.4–0.6 mm, glabrous. Stamens 2, glabrous, enclosed within the concave corolla lobes; filaments 0.1–0.2 mm long with a blunt terminal umbo; anthers 1.1–1.5 mm long, 1.3–1.4 mm wide. Ovary glabrous, 0.7–1 mm long at anthesis; style 0.1–0.15 mm long; stigma pink, 2-lobed, 0.25–0.35 mm long. Drupe globular to ovoid, dark blue, 6–8 mm long, 5–8 mm diameter; mesocarp 1–1.5 mm thick; endocarp woody, 0.3–0.4 mm thick. **Fig. 2.**

Specimens examined. Queensland, MORETON DISTRICT: Banks of Brisbane R., near Karana Downs, Jul 1981, *Bird* AQ348158 (BRI); Cliffs above Brisbane R., near Karana Downs, Jun 1981, *Bird* AQ348213 (BRI); Mt Crosby road, opposite Bunya St, Jul 1985, *Guym. 1987 & Self* (BRI), *Self & Dillewaard* s.n. (BRI,NE,NSW); end of Bunya St, off Mt Crosby road, 13.8 km W of Kenmore, Jul 1985, *Guym. 1990* (AD,BRI,CANB,DNA,K,L,MEL,MO,NSW,PERTH), *Guym. 1989 & Self* (BRI,CBG,MEL,NE), *Guym. 1988 & Self* (BRI, K), *Self & Dillewaard* (AD,BRI,QRS); Tyamolum Scout camp site, vicinity of Kholo Ck, Bunya St, Mt Crosby, Nov 1985, *Bird* s.n. (BRI,CANB,K,MEL,NE,NSW); Frenchs Ck road, ca 12 km SW of Boonah, Jul 1984, *Bird* AQ395662 (BRI).

Distribution: The species is known from the Mt Crosby area, on the western outskirts of the city of Brisbane and from the Boonah district, southwest of Brisbane.

Ecology: *N. lloydii* occurs in the ecotone between eucalypt open forests and vine thickets. The most common associated eucalypts are *E. crebra* F.Muell. and *E. maculata* Hook. with associated trees and shrubs of *Brachychiton populneus* (Schott & Endl.) R.Br., *Alphitonia excelsa* R.Br., *Acacia aulacocarpa* Cunn. ex Benth., *A. concurrens* Pedley, *A. falcata* Willd., and *Diospyros ferrea* (Willd.) Bakh. var. *geminata* (Willd.) Bakh.

Flowering period: June to early August.

Fruiting period: October to December.

Notes: *N. lloydii* will key to *N. microcarpa* in Green's (1968) revision of *Notelaea* and in the Flora of South-eastern Queensland (Stanley & Ross 1986) but can be distinguished from this species by its verruculose linear leaves, 5–9-flowered inflorescences and multistemmed habit.

Conservation status: The species is presently known from two locations sixty kilometres apart. The populations that occur on the Tyamolum Scout camp site and in Moggill State Forest (L.H.Bird, pers. comm.) are reasonably well protected from the encroaching urbanisation. However, *N. lloydii* is assessed as restricted and vulnerable (2V) using the risk coding of Leigh, Briggs and Hartley (1981) until further distributional data are obtained.

Etymology: Named in honour of Mr Lloyd Bird of Bundamba who drew my attention to the distinctiveness of this species. Mr Bird is an avid botanical collector who has provided numerous specimens of botanical importance for the Queensland Herbarium, including *N. lloydii*.

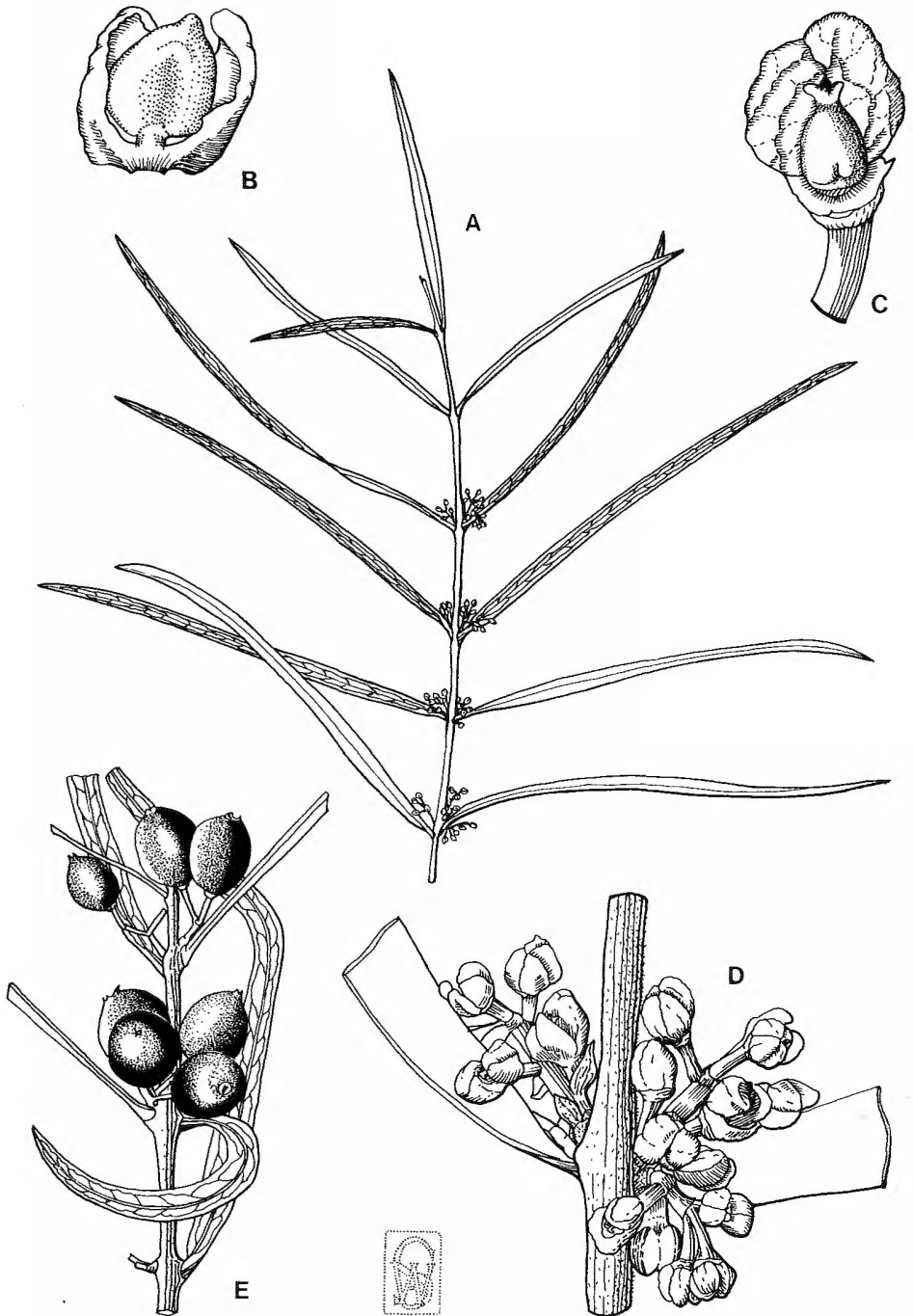


Fig. 2. *Notelaea lloydii*: A. flowering branchlet $\times 2/3$. B. stamen and two corolla lobes $\times 12$. C. flower with front two corolla lobes removed showing ovary $\times 12$. D. inflorescence $\times 4$. E. fruiting branchlet $\times 2$. A–D from Guymer 1990; E from Bird s.n. (Nov 1985).

Acknowledgments

The assistance of Mrs Val Hando in obtaining flowering and preserved material of *N. pungens* is gratefully acknowledged. I also wish to thank Mr Lloyd Bird for bringing *N. lloydii* to my attention and for discussion with him on its distribution. Mr Alan Self assisted with field work and Mr Will Smith drew the illustrations.

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RACOSPERMA MARTIUS (LEGUMINOSAE: MIMOSOIDEAE) IN QUEENSLAND: A CHECKLIST

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Summary

The 246 species of *Racosperma* Martius known to occur in Queensland are listed alphabetically. New combinations are made for 228 species, 14 subspecies and two varieties. Most of the species were previously referred to *Acacia* Miller.

The recognition of *Acacia* Miller subg. *Phyllodineae* Seringe as a distinct genus, *Racosperma* Martius (Pedley 1986), necessitates the transfer of most Australian species described as *Acacia* to *Racosperma*. Martius himself made only a few transfers. *Racosperma* is reasonably well known in Queensland and now is an appropriate time to publish a list of species.

Changes in the rank of some taxa are made but the circumscription of the great majority remains as before (see Pedley 1978, 1980, 1981, 1987; Pedley & Forster 1986).

Checklist

***Racosperma acradenia* (F.Muell.) Pedley, comb. nov.**

Acacia acradenia F.Muell., Iconog. Austral Acacia, Decade 11. 4th Plate (1888).

***Racosperma adsurgens* (Maiden & Blakely) Pedley, comb. nov.**

Acacia adsurgens Maiden & Blakely, J. & Proc. Roy. Soc. Western Australia 13: 28 (1928).

***Racosperma aduncum* (Cunn. ex G.Don) Pedley, comb. nov.**

Acacia adunca Cunn. ex G.Don, Gen. Hist. 2: 406 (1832).

***Racosperma allenianum* (Maiden) Pedley, comb. nov.**

Acacia alleniana Maiden in Ewart & Davies, Fl. N. Territory: 330 (1917).

***Racosperma amblygonum* (Cunn. ex Benth.) Pedley, comb. nov.**

Acacia amblygona Cunn. ex Benth., London J. Bot. 1: 332 (1842).

***Racosperma ammophilum* (Pedley) Pedley, comb. nov.**

Acacia ammophila Pedley, Austrobaileya 1: 197 (1978).

***Racosperma ancistrocarpum* (Maiden & Blakely) Pedley, comb. nov.**

Acacia ancistrocarpa Maiden & Blakely, J. & Proc. Roy. Soc. Western Australia 13: 31 (1928).

***Racosperma aneurum* (F.Muell. ex Benth.) Pedley, comb. nov.**

Acacia aneura F.Muell. ex Benth., Linnaea 26: 627 (1855).

***Racosperma angustum* (Maiden & Blakely) Pedley, comb. nov.**

Acacia angusta Maiden & Blakely, Proc. Roy. Soc. Queensland 38: 115 (1927).

***Racosperma apreptum* (Pedley) Pedley, comb. nov.**

Acacia aprepta Pedley, Contr. Queensland Herb. 15: 5 (1974).

***Racosperma argyraeum* (Tindale) Pedley, comb. nov.**

Acacia argyraea Tindale, Contr. New South Wales Natl. Herb. 4: 141 (1970).

- Racosperma argyrodendron** (Domin) Pedley, **comb. nov.**
Acacia argyrodendron Domin, Biblioth. Bot. 89: 261 (1926).
- Racosperma armillatum** Pedley, *Austrobaileya* 2: 325 (1987).
- Racosperma armitii** (F.Muell. ex Maiden) Pedley, **comb. nov.**
Acacia armitii F.Muell. ex Maiden, J. & Proc. Roy. Soc. New South Wales 51: 84 (1917).
- Racosperma asperulaceum** (F.Muell.) Pedley, **comb. nov.**
Acacia asperulacea F.Muell., J. Proc. Linn. Soc., Bot. 3: 123 (1859).
- Racosperma attenuatum** (Maiden & Blakely) Pedley, **comb. nov.**
Acacia attenuata Maiden & Blakely, Proc. Roy. Soc. Queensland 38: 117 (1927).
- Racosperma aulacocarpum** (Cunn. ex Benth.) Pedley, **comb. nov.**
Acacia aulacocarpa Cunn. ex Benth., London J. Bot. 1: 378 (1842).
- R. aulacocarpum** var. **aulacocarpum**
- R. aulacocarpum** var. **fruticosum** (C.White) Pedley, **comb. nov.**
Acacia aulacocarpa var. *fruticosa* C.White, Proc. Roy. Soc. Queensland 57: 23 (1946).
- Racosperma auriculiforme** (Cunn. ex Benth.) Pedley, J. Linn. Soc., Bot. 92: 247 (1986).
- Racosperma baeuerlenii** (Maiden & R.Baker) Pedley, **comb. nov.**
Acacia baeuerlenii Maiden & R.Baker, Proc. Linn. Soc. New South Wales ser. 2, 10: 583 (1896).
- Racosperma baileyana** (F.Muell.) Pedley, **comb. nov.**
Acacia baileyana F.Muell., Trans. & Proc. Roy. Soc. Victoria 24: 168 (1888).
- Racosperma bakeri** (Maiden) Pedley, **comb. nov.**
Acacia bakeri Maiden, Proc. Linn. Soc. New South Wales ser. 2, 10: 337 (1895).
- Racosperma bancroftii** (Maiden) Pedley, **comb. nov.**
Acacia bancroftii Maiden, Proc. Roy. Soc. Queensland 30: 26 (1918).
- Racosperma baueri** (Benth.) Pedley, **comb. nov.**
Acacia baueri Benth., London J. Bot. 1: 344 (1842).
- Racosperma betchei** (Maiden & Blakely) Pedley, **comb. nov.**
Acacia betchei Maiden & Blakely, J. & Proc. Roy. Soc. New South Wales 60: 174 (1927).
- Racosperma binervatum** (DC.) Pedley, **comb. nov.**
Acacia binervata DC., Prodr. 2: 452 (1825).
- Racosperma blakei** (Pedley) Pedley, **comb. nov.**
Acacia blakei Pedley, Contr. Queensland Herb. 15: 6 (1974).
- R. blakei** subsp. **blakei**
- R. blakei** subsp. **diphyllum** (Tindale) Pedley, **comb. & stat. nov.**
Acacia diphylla Tindale, Telopea 1: 79 (1975).
- Racosperma brachycarpum** (Pedley) Pedley, **comb. nov.**
Acacia brachycarpa Pedley, Contr. Queensland Herb. 4: 5 (1969).
- Racosperma brachystachyum** (Benth.) Pedley, **comb. nov.**
Acacia brachystachya Benth., Fl. Austral. 2: 403 (1864).
- Racosperma brassii** (Pedley) Pedley, **comb. nov.**
Acacia brassii Pedley, Contr. Queensland Herb. 15: 6 (1974).

Racosperma brownei (Poiret) Pedley, **comb. nov.***Mimosa brownei* Poiret, Encycl. Meth. Bot. Suppl. 5: 530 (1817).**Racosperma brunioides** (Cunn. ex G.Don) Pedley, **comb. nov.***Acacia brunioides* Cunn. ex G.Don, Gen. Hist. 2: 404 (1832).**R. brunioides** subsp. **brunioides****R. brunioides** subsp. **graniticum** (Pedley) Pedley, **comb. nov.***Acacia brunioides* subsp. *granitica* Pedley, Austrobaileya 1: 246 (1980).**Racosperma burbidgeae** (Pedley) Pedley, **comb. nov.***Acacia burbidgeae* Pedley, Austrobaileya 1: 249 (1980).**Racosperma burrowii** (Maiden) Pedley, **comb. nov.***Acacia burrowii* Maiden, J. & Proc. Roy. Soc. New South Wales 53: 227 (1920).**Racosperma buxifolium** (Cunn.) Pedley, **comb. nov.***Acacia buxifolia* Cunn. in Field, Geogr. Mem. New South Wales: 344 (1825).**R. buxifolium** subsp. **buxifolium****R. buxifolium** subsp. **pubiflorum** (Pedley) Pedley, **comb. nov.***Acacia buxifolia* subsp. *pubiflora* Pedley, Austrobaileya 1: 281 (1980).**Racosperma calanthum** (Pedley) Pedley, **comb. nov.***Acacia calantha* Pedley, Austrobaileya 1: 261 (1980).**Racosperma calcicola** (Forde & Ising) Pedley, **comb. nov.***Acacia calcicola* Forde & Ising, Trans. & Proc. Roy. Soc. South Australia 81: 153 (1958).**Racosperma calyculatum** (Cunn. ex Benth.) Pedley, **comb. nov.***Acacia calyculata* Cunn. ex Benth., London J. Bot. 1: 379 (1842).**Racosperma cambagei** (R.Baker) Pedley, **comb. nov.***Acacia cambagei* R.Baker, Proc. Linn. Soc. New South Wales 25: 661 (1901).**Racosperma canum** (Maiden) Pedley, **comb. nov.***Acacia cana* Maiden, J. & Proc. Roy. Soc. New South Wales 53: v(errata) (1920).**Racosperma caroleae** (Pedley) Pedley, **comb. nov.***Acacia caroleae* Pedley, Austrobaileya 1: 132 (1978).**Racosperma catenulatum** (C.White) Pedley, **comb. nov.***Acacia catenulata* C.White, Proc. Roy. Soc. Queensland 55: 63 (1944).**Racosperma centrinervium** (Maiden & Blakely) Pedley, **comb. nov.***Acacia centrinervia* Maiden & Blakely, J. & Proc. Roy. Soc. New South Wales 60: 172 (1927).

The holotype was collected at Parkes, New South Wales. Two paratypes were cited: Inglewood, Queensland, *C.J.Smith* per *C.White*, October 1922 and Eumundi (sic), *Bailey* ('which we have not seen'). The species which is closely related to *R. lineatum* is not represented in the collections of the Queensland Herbarium (BRI).

Racosperma chinchillense (Tindale) Pedley, **comb. nov.***Acacia chinchillensis* Tindale, Telopea 1: 380 (1978).**Racosperma chippendalei** (Pedley) Pedley, **comb. nov.***Acacia chippendalei* Pedley, Contr. Queensland Herb. 11: 12 (1972).**Racosperma chisholmii** (Bailey) Pedley, **comb. nov.***Acacia chisholmii* Bailey, Queensland Agric. J. 4: 47 (1899).

- Racosperma cincinnatum** (F.Muell.) Pedley, **comb. nov.**
Acacia cincinnata F.Muell., *Fragm.* 11: 35 (1878).
- Racosperma complanatum** (Cunn. ex Benth.) Pedley, **comb. nov.**
Acacia complanata Cunn. ex Benth., *London J. Bot.* 1: 369 (1842).
- Racosperma concurrens** (Pedley) Pedley, *J. Linn. Soc., Bot.* 92: 248 (1986).
- Racosperma confertum** (Cunn. ex Benth.) Pedley, **comb. nov.**
Acacia conferta Cunn. ex Benth., *London J. Bot.* 1: 345 (1842).
- Racosperma conjunctifolium** (F.Muell.) Pedley, **comb. nov.**
Acacia conjunctifolia F.Muell., *Fragm.* 11: 68 (1879).
- Racosperma coriaceum** (DC.) Pedley, *J. Linn. Soc., Bot.* 92: 248 (1986).
- Racosperma cowleanum** (Tate) Pedley, **comb. nov.**
Acacia cowleana Tate, *Report Horn Sci. Exped. III*: 157, 187 (1896).
- Racosperma crassum** (Pedley) Pedley, **comb. nov.**
Acacia crassa Pedley, *Contr. Queensland Herb.* 15: 9 (1974).
- R. crassum** subsp. **crassum**
- R. crassum** subsp. **longicomum** (Pedley) Pedley, **comb. nov.**
A. crassa subsp. *longicoma* Pedley, *Austrobaileya* 1: 178 (1978).
- Racosperma crassicaepum** (Cunn. ex Benth.) Pedley, **comb. nov.**
Acacia crassicaepa Cunn. ex Benth., *London J. Bot.* 1: 379 (1842).
- Racospermum crenatum** (Pedley) Pedley, **comb. nov.**
Acacia crenata Pedley, *Contr. Queensland Herb.* 4: 1 (1969).
- Racosperma crombiei** (C.White) Pedley, *J. Linn. Soc., Bot.* 92: 247 (1986).
- Racosperma cultriforme** (Cunn. ex G.Don) Pedley, **comb. nov.**
Acacia cultriformis Cunn. ex G.Don, *Gen. Hist.* 2: 406 (1832).
- Racosperma curranii** (Maiden) Pedley, **comb. nov.**
Acacia curranii Maiden, *J. & Proc. Roy. Soc. New South Wales* 49: 492 (1916).
- Racosperma cyperophyllum** (F.Muell. ex Benth.) Pedley, **comb. nov.**
Acacia cyperophylla F.Muell. ex Benth., *Fl. Austral.* 2: 400 (1864).
- Racosperma dawsonii** (R.Baker) Pedley, **comb. nov.**
Acacia dawsonii R.Baker, *Proc. Linn. Soc. New South Wales* 22: 153 (1897).
- Racosperma deanei** (R.Baker) Pedley, *J. Linn. Soc., Bot.* 92: 248 (1986).
- Racosperma debile** (Tindale) Pedley, **comb. nov.**
Acacia debilis Tindale, *Telopea* 1: 382 (1978).
- Racosperma decorum** (H.G.Reichb.) Pedley, **comb. nov.**
Acacia decora H.G.Reichb., *Iconogr. Bot. Exot.* 2: 35 (1838).
- Racosperma deuteroneurum** (Pedley) Pedley, **comb. nov.**
Acacia deuteroneura Pedley, *Austrobaileya* 1: 293 (1980).
- Racosperma dictyophlebium** (F.Muell.) Pedley, **comb. nov.**
Acacia dictyophleba F.Muell., *Fragm.* 3: 128 (1863).
- Racosperma dietrichianum** (F.Muell.) Pedley, **comb. nov.**
Acacia dietrichiana F.Muell., *S. Sci. Rec.* 2: 149 (1882).

Racosperma difficile (Maiden) Pedley, **comb. nov.***Acacia difficilis* Maiden in Ewart & Davies, Fl. N. Territory: 344 (1917).**Racosperma dimidiatum** (Benth.) Pedley, **comb. nov.***Acacia dimidiata* Benth., London J. Bot. 1: 381 (1842).**Racosperma drepanocarpum** (F.Muell.) Pedley, **comb. nov.***Acacia drepanocarpa* F.Muell., J. Proc. Linn. Soc., Bot. 3: 137 (1859).**R. drepanocarpum** subsp. **drepanocarpum****R. drepanocarpum** subsp. **latifolium** (Pedley) Pedley, **comb. nov.***Acacia drepanocarpa* subsp. *latifolia* Pedley, Contr. Queensland Herb. 15: 10 (1974).**Racosperma ensifolium** (Pedley) Pedley, J. Linn. Soc., Bot. 92: 248 (1986).**Racosperma eremophiloides** (Pedley & P.Forster) Pedley, **comb. nov.***Acacia eremophiloides* Pedley & P.Forster, Austrobaileya 2: 277 (1986).**Racosperma estrophiolatum** (F.Muell.) Pedley, **comb. nov.***Acacia estrophiolata* F.Muell., S. Sci. Rec. 2: 150 (1882).**Racosperma everistii** (Pedley) Pedley, **comb. nov.***Acacia everistii* Pedley, Austrobaileya 1: 279 (1980).**Racosperma excelsum** (Benth.) Pedley, **comb. nov.***Acacia excelsa* Benth. in Mitchell, J. Exped. Trop. Australia: 225 (1848).**R. excelsum** subsp. **excelsum****R. excelsum** subsp. **angustum** (Pedley) Pedley, **comb. nov.***A. excelsa* subsp. *angusta* Pedley, Austrobaileya 1: 213 (1978).**Racosperma falcatum** (Willd.) Martius, Hort. Reg. Monac. Semin. (1835).

I inadvertently made this combination a second time (Pedley 1986).

Racosperma falciforme (DC.) Pedley, **comb. nov.***Acacia falciformis* DC., Prodr. 2: 452 (1825).**Racosperma fasciculiferum** (F.Muell. ex Benth.) Pedley, **comb. nov.***Acacia fasciculifera* F.Muell. ex Benth., Fl. Austral. 2: 361 (1864).**Racosperma filicifolium** (Cheel & Welch) Pedley, **comb. nov.***Acacia filicifolia* Cheel & Welch, J. & Proc. Roy. Soc. New South Wales 65: 232 (1932).**Racosperma fimbriatum** (Cunn. ex G.Don) Pedley, **comb. nov.***Acacia fimbriata* Cunn. ex G.Don, Gen. Hist. 2: 406 (1832).**Racosperma flavescens** (Cunn. ex Benth.) Pedley, **comb. nov.***Acacia flavescens* Cunn. ex Benth., London J. Bot. 1: 381 (1842).**Racosperma fleckeri** (Pedley) Pedley, **comb. nov.***Acacia fleckeri* Pedley, Austrobaileya 1: 211 (1978).**Racosperma flexifolium** (Cunn. ex Benth.) Pedley, **comb. nov.***Acacia flexifolia* Cunn. ex Benth., London J. Bot. 1: 359 (1842).**Racosperma floribundum** (Vent.) Pedley, **comb. nov.***Mimosa floribunda* Vent., Choix des Plantes t.13 (1803).**Racosperma floydii** (Tindale) Pedley, **comb. nov.***Acacia floydii* Tindale, Telopea 1: 439 (1980).

Racosperma galioides (Benth.) Pedley, **comb. nov.***Acacia galioides* Benth., London J. Bot. 1: 344 (1842).

Contrary to my previous treatment of this taxon (Pedley 1972) I have not recognised any infraspecific taxa.

Racosperma georginae (Bailey) Pedley, **comb. nov.***Acacia georginae* Bailey, Queensland Depart. Agric. Stock., Bot. Bull. 13: 9 (1896).**Racosperma gittinsii** (Pedley) Pedley, **comb. nov.***Acacia gittinsii* Pedley, Proc. Roy. Soc. Queensland 75: 30 (1964).**Racosperma glaucocarpum** (Maiden & Blakely) Pedley, **comb. nov.***Acacia glaucocarpa* Maiden & Blakely, Proc. Roy. Soc. Queensland 38: 120 (1927).**Racosperma gnidium** (Benth.) Pedley, **comb. nov.***Acacia gnidium* Benth., Fl. Austral. 2: 359 (1864).**Racosperma gonocladum** (F.Muell.) Pedley, **comb. nov.***Acacia gonoclada* F.Muell., J. Proc. Linn. Soc., Bot. 3: 140 (1859).**Racosperma grandifolium** (Pedley) Pedley, **comb. nov.***Acacia grandifolia* Pedley, Austrobaileya 1: 183 (1978).**Racosperma graniticum** (Maiden) Pedley, **comb. nov.***Acacia granitica* Maiden, J. & Proc. Roy. Soc. New South Wales 54: 230 (1921).**Racosperma gunnii** (Benth.) Pedley, **comb. nov.***Acacia gunnii* Benth., London J. Bot. 1: 332 (1842).**Racosperma guymeri** (Tindale) Pedley, **comb. nov.***Acacia guymeri* Tindale, Telopea 1: 377 (1978).**Racosperma hakeoides** (Cunn. ex Benth.) Pedley, **comb. nov.***Acacia hakeoides* Cunn. ex Benth., London J. Bot. 1: 354 (1842).**Racosperma hammondii** (Maiden) Pedley, **comb. nov.***Acacia hammondii* Maiden, J. & Proc. Roy. Soc. New South Wales 51: 95 (1917).**Racosperma handonis** (Pedley) Pedley, **comb. nov.***Acacia handonis* Pedley, Austrobaileya 1: 344 (1981).**Racosperma harpophyllum** (F.Muell. ex Benth.) Pedley, **comb. nov.***Acacia harpophylla* F.Muell. ex Benth., Fl. Austral. 2: 389 (1864).**Racosperma hemignostum** (F.Muell.) Pedley, **comb. nov.***Acacia hemignosta* F.Muell., J. Proc. Linn. Soc., Bot. 3: 134 (1859).**Racosperma hemsleyi** (Maiden) Pedley, **comb. nov.***Acacia hemsleyi* Maiden, J. & Proc. Roy. Soc. New South Wales 51: 87 (1917).**Racosperma hillianum** (Maiden) Pedley, **comb. nov.***Acacia hilliana* Maiden in Ewart & Davies, Fl. N. Territory: 340 (1917).**Racosperma hispidulum** (Smith) Martius, Hort. Reg. Monac. Semin. (1835).**Racosperma hockingsii** (Pedley) Pedley, **comb. nov.***Acacia hockingsii* Pedley, Austrobaileya 1: 255 (1980).**Racosperma holosericeum** (Cunn. ex G.Don) Pedley, **comb. nov.***Acacia holosericea* Cunn. ex G.Don, Gen. Hist. 2: 407 (1832).

- Racosperma holotrichum** (Pedley) Pedley, **comb. nov.**
Acacia holotricha Pedley, *Austrobaileya* 1: 275 (1980).
- Racosperma homalocladum** (F.Muell.) Pedley, **comb. nov.**
Acacia homaloclada F.Muell., *Fragm.* 11: 34 (1878).
- Racosperma hubbardianum** (Pedley) Pedley, **comb. nov.**
Acacia hubbardiana Pedley, *Contr. Queensland Herb.* 4: 2 (1969).
- Racosperma humifusum** (Cunn. ex Benth.) Pedley, **comb. nov.**
Acacia humifusa Cunn. ex Benth., *London J. Bot.* 1: 382 (1842).
- Racosperma hyaloneurum** (Pedley) Pedley, **comb. nov.**
Acacia hyaloneura Pedley, *Austrobaileya* 1: 157 (1978).
- Racosperma hylonomum** (Pedley) Pedley, *J. Linn. Soc., Bot.* 92: 248 (1986).
- Racosperma implexum** (Benth.) Pedley, **comb. nov.**
Acacia implexa Benth., *London J. Bot.* 1: 368 (1842).
- Racosperma irroratum** (Sieber ex Sprengel) Pedley, **comb. nov.**
Acacia irrorata Sieber ex Sprengel, *Syst. Veg.* ed. 16. 3: 141 (1826).
- Racosperma islanum** (Pedley) Pedley, **comb. nov.**
Acacia islana Pedley, *Austrobaileya* 1: 249 (1980).
- Racosperma ixiophyllum** (Benth.) Pedley, **comb. nov.**
Acacia ixiophylla Benth., *London J. Bot.* 1: 364 (1842).
- Racosperma ixodes** (Pedley) Pedley, **comb. nov.**
Acacia ixodes Pedley, *Austrobaileya* 1: 256 (1980).
- Racosperma jackesianum** (Pedley) Pedley, **comb. nov.**
Acacia jackesiana Pedley, *Austrobaileya* 1: 128 (1978).
- Racosperma johnsonii** (Pedley) Pedley, **comb. nov.**
Acacia johnsonii Pedley, *Austrobaileya* 1: 245 (1980).
- Racosperma jucundum** (Maiden & Blakely) Pedley, **comb. nov.**
Acacia jucunda Maiden & Blakely, *Proc. Roy. Soc. Queensland* 38: 119 (1927).
- Racosperma juliferum** (Benth.) Pedley, *J. Linn. Soc., Bot.* 92: 248 (1986).
R. juliferum subsp. **juliferum**
R. juliferum subsp. **gilbertense** (Pedley) Pedley, **comb. nov.**
Acacia julifera subsp. *gilbertensis* Pedley, *Austrobaileya* 1: 162 (1978).
- Racosperma juncifolium** (Benth.) Pedley, **comb. nov.**
Acacia juncifolia Benth., *London J. Bot.* 1: 341 (1842).
- Racosperma kempeanum** (F.Muell.) Pedley, **comb. nov.**
Acacia kempeana F.Muell., *Chem. & Druggist* 5(51) *Australasian Supplement*: 26 (1882).
- Racosperma laccatum** (Pedley) Pedley, **comb. nov.**
Acacia laccata Pedley, *Proc. Roy. Soc. Queensland* 75: 31 (1964).
- Racosperma lanigerum** (Cunn.) Pedley, **comb. nov.**
Acacia lanigera Cunn. in *Field, Geogr. Mem. New South Wales*: 345 (1825).
- Racosperma latifolium** (Benth.) Pedley, **comb. nov.**
Acacia latifolia Benth., *London J. Bot.* 1: 382 (1842).

Racosperma latisepalum (Pedley) Pedley, **comb. nov.***Acacia latisepala* Pedley, Proc. Roy. Soc. Queensland 75: 31 (1964).**Racosperma lautum** (Pedley) Pedley, **comb. nov.***Acacia lauta* Pedley, Austrobaileya 1: 257 (1980).**Racosperma lazaridis** (Pedley) Pedley, **comb. nov.***Acacia lazaridis* Pedley, Austrobaileya 1: 341 (1981).**Racosperma legnotum** (Pedley) Pedley, **comb. nov.***Acacia legnota* Pedley, Austrobaileya 1: 215 (1978).**Racosperma leichhardtii** (Benth.) Pedley, **comb. nov.***Acacia leichhardtii* Benth., Fl. Austral. 2: 372 (1864).**Racosperma leiocalyx** (Domin) Pedley, **comb. et stat. nov.***Acacia glaucescens* Willd. var. *leiocalyx* Domin, Biblioth. Bot. 89: 269 (1926).

Variation within the species is great; further work is needed and no infraspecific taxa are recognised at this time.

Racosperma leptocarpum (Cunn. ex Benth.) Pedley, **comb. nov.***Acacia leptocarpa* Cunn. ex Benth., London J. Bot. 1: 376 (1842).**Racosperma leptolobum** (Pedley) Pedley, **comb. nov.***Acacia leptoloba* Pedley, Austrobaileya 1: 220 (1978).**Racosperma leptostachyum** (Benth.) Pedley, **comb. nov.***Acacia leptostachya* Benth., Fl. Austral. 2: 406 (1864).**Racosperma leucocladum** (Tindale) Pedley, **comb. nov.***Acacia leucoclada* Tindale, Proc. Linn. Soc. New South Wales: 91: 149 (1966).**R. leucocladum** subsp. **leucocladum**

New South Wales, not in Queensland.

R. leucocladum subsp. **argentifolium** (Tindale) Pedley, **comb. nov.***Acacia leucoclada* subsp. *argentifolia* Tindale, Proc. Linn. Soc. New South Wales 91: 151 (1966).**Racosperma ligulatum** (Cunn. ex Benth.) Pedley, **comb. nov.***Acacia ligulata* Cunn. ex Benth., London J. Bot. 1: 362 (1842).

I have followed Whibley (1980), Maslin (1981) and Maslin & Pedley (1982) in recognising this taxon as a distinct species rather than as a subspecies of *Acacia bivenosa* DC. (Pedley 1977).

Racosperma limbatum (F.Muell.) Pedley, **comb. nov.***Acacia limbata* F.Muell., J. Proc. Linn. Soc., Bot. 3: 145 (1859).**Racosperma lineatum** (Cunn. ex G.Don) Pedley, **comb. nov.***Acacia lineata* Cunn. ex G.Don, Gen. Hist. 2: 403 (1832).**Racosperma longipedunculatum** (Pedley) Pedley, **comb. nov.***Acacia longipedunculata* Pedley, Contr. Queensland Herb. 11: 17 (1972).**Racosperma longispicatum** (Benth.) Pedley, **comb. nov.***Acacia longispicata* Benth. in Mitchell, J. Exped. Trop. Australia: 298 (1848).**R. longispicatum** subsp. **longispicatum****R. longispicatum** subsp. **velutinum** (Pedley) Pedley, **comb. nov.***Acacia longispicata* subsp. *velutina* Pedley, Austrobaileya 1: 176 (1978).

- Racosperma longissimum** (H.Wendl.) Pedley, **comb. nov.**
Acacia longissima H.Wendl., Comm. Acac. 5: 45 (1820).
- Racosperma lorolobum** (Tindale) Pedley, **comb. nov.**
Acacia loroloba Tindale, Contr. New South Wales Natl. Herb. 4: 137 (1970).
- Racosperma lysiphloium** (F.Muell.) Pedley, **comb. nov.**
Acacia lysiphloia F.Muell., J. Proc. Linn. Soc., Bot. 3: 137 (1859).
- Racosperma macradenium** (Benth.) Pedley, **comb. nov.**
Acacia macradenia Benth. in Mitchell. J. Exped. Tropical Australia: 360 (1848).
- Racosperma maidenii** (F.Muell.) Pedley, **comb. nov.**
Acacia maidenii F.Muell., Bot. Centralbl. 51: 398 (1892).
- Racosperma maitlandii** (F.Muell.) Pedley, J. Linn. Soc., Bot. 92: 248 (1986).
- Racosperma mangium** (Willd.) Pedley, **comb. nov.**
Acacia mangium Willd., Sp. Plant. ed. 4, 4: 1053 (1806).
- Racosperma maranoense** (Pedley) Pedley, **comb. nov.**
Acacia maranoensis Pedley, Austrobaileya 1: 194 (1978).
- Racosperma megalanthum** (F.Muell.) Pedley, **comb. nov.**
Acacia megalantha F.Muell., J. Proc. Linn. Soc., Bot. 3: 143 (1859).
- Racosperma meiospermum** Pedley, Austrobaileya 2: 321 (1987).
- Racosperma melanoxyton** (R.Br.) Martius, Hort. Reg. Monac. Semin. (1835).
 This combination was inadvertently made by me a second time (Pedley 1986).
- Racosperma melleodorum** (Pedley) Pedley, **comb. nov.**
Acacia melleodora Pedley, Austrobaileya 1: 205 (1978).
- Racosperma melvillei** (Pedley) Pedley, **comb. nov.**
Acacia melvillei Pedley, Austrobaileya 1: 201 (1978).
- Racosperma microcephalum** (Pedley) Pedley, **comb. nov.**
Acacia microcephala Pedley, Austrobaileya 1: 193 (1978).
- Racosperma microspermum** (Pedley) Pedley, **comb. nov.**
Acacia microsperma Pedley, Contr. Queensland Herb. 15: 21 (1974).
- Racosperma mimulum** (Pedley) Pedley, **comb. nov.**
Acacia mimula Pedley, Austrobaileya 1: 29 (1977).
- Racosperma montanum** (Benth.) Pedley, **comb. nov.**
Acacia montana Benth., London J. Bot. 1: 360 (1842).
- Racosperma monticola** (J.Black) Pedley, **comb. nov.**
Acacia monticola J.Black, Trans. & Proc. Roy. Soc. South Australia 61: 246 (1937).
- Racosperma muellerianum** (Maiden & R.Baker) Pedley, **comb. nov.**
Acacia muelleriana Maiden & R.Baker, Proc. Linn. Soc. New South Wales ser. 2, 8: 515 (1894).
- Racosperma multisiliquum** (Benth.) Pedley, **comb. et. stat. nov.**
Acacia simsii Benth. var. *multisiliqua* Benth., Fl. Austral. 2: 383 (1864).
- Racosperma murrayanum** (F.Muell. ex Benth.) Pedley, **comb. nov.**
Acacia murrayana F.Muell. ex Benth., Fl. Austral. 2: 370 (1864).
- Racosperma myrtifolium** (Smith) Martius, Hort. Reg. Monac. Semin. (1835).

Racosperma neriifolium (Cunn. ex Benth.) Pedley, **comb. nov.**

Acacia neriifolia Cunn. ex Benth., London J. Bot. 1: 357 (1842).

R. neriifolium subsp. **neriifolium**

R. neriifolium subsp. **pustulum** (Maiden & Blakely) Pedley, **comb. et stat. nov.**

Acacia pustula Maiden & Blakely, Proc. Roy. Soc. Queensland 38: 117 (1927).

Racosperma nesophilum (Pedley) Pedley, **comb. nov.**

Acacia nesophila Pedley, Contr. Queensland Herb. 15: 12 (1974).

Racosperma nuperrimum (E.G.Baker) Pedley, **comb. nov.**

Acacia nuperrima E.G.Baker, J. Bot. 6: 92 (1926).

R. nuperrimum subsp. **nuperrimum**

R. nuperrimum subsp. **cassiterum** (Pedley) Pedley, **comb. nov.**

Acacia nuperrima subsp. *cassitera* Pedley, Austrobaileya 1: 188 (1978).

Racosperma obtusifolium (Cunn.) Pedley, **comb. nov.**

Acacia obtusifolia Cunn. in Field, Geogr. Mem. New South Wales: 345 (1825).

Racosperma oligophlebium (Pedley) Pedley, **comb. nov.**

Acacia oligophleba Pedley, Austrobaileya 1: 174 (1978).

Racosperma omalophyllum (Cunn. ex Benth.) Pedley, **comb. nov.**

Acacia omalophylla Cunn. ex Benth., London J. Bot. 1: 365 (1842).

Racosperma ommatospermum Pedley, Austrobaileya 2: 327 (1987).

Racosperma orarium (F.Muell.) Pedley, J. Linn. Soc., Bot. 92: 249 (1986).

Racosperma orites (Pedley) Pedley, **comb. nov.**

Acacia orites Pedley, Proc. Roy. Soc. Queensland 75: 32 (1964).

Racosperma orthocarpum (F.Muell.) Pedley, **comb. nov.**

Acacia orthocarpa F.Muell., J. Proc. Linn. Soc., Bot. 3: 136 (1859).

Racosperma oshanesii (F.Muell. & Maiden) Pedley, **comb. nov.**

Acacia oshanesii F.Muell. & Maiden, Proc. Linn. Soc. New South Wales ser. 2, 8: 15 (1893).

Racosperma oswaldii (F.Muell.) Pedley, **comb. nov.**

Acacia oswaldii F.Muell., Pl. Indig. Colony Victoria 2: 27 (1863).

Racosperma paniculatum Pedley, Austrobaileya 2: 324 (1987).

Racosperma paradoxum (DC.) Martius, Hort. Reg. Monac. Semin. (1835).

Racosperma pendulum (Cunn. ex G.Don) Pedley, **comb. nov.**

Acacia pendula Cunn. ex G.Don, Gen. Hist. 2: 404 (1832).

Racosperma penninerve (Sieber ex DC.) Pedley, J. Linn. Soc., Bot. 92: 239 (1986).

R. penninerve var. **penninerve**

R. penninerve var. **longiracemosum** (Domin) Pedley, **comb. nov.**

Acacia penninervis var. *longiracemosa* Domin, Biblioth. Bot. 89: 254 (1926).

Racosperma perangustum (C.White) Pedley, **comb. & stat. nov.**

Acacia fimbriata var. *perangusta* C.White, Proc. Roy. Soc. Queensland 50: 72 (1939).

Racosperma petraeum (Pedley) Pedley, J. Linn. Soc., Bot. 92: 249 (1986).

Racosperma peuce (F.Muell.) Pedley, J. Linn. Soc., Bot. 92: 249 (1986).

Racosperma phlebocarpum (F.Muell.) Pedley, **comb. nov.**

Acacia phlebocarpa F.Muell., J. Proc. Linn. Soc., Bot. 3: 119 (1859).

Racosperma platycarpum (F.Muell.) Pedley, **comb. nov.**

Acacia platycarpa F.Muell., J. Proc. Linn. Soc., Bot. 3: 145 (1859).

Racosperma plectocarpum (Cunn. ex Benth.) Pedley, **comb. nov.**

Acacia plectocarpa Cunn. ex Benth., London J. Bot. 1: 375 (1842).

R. plectocarpum subsp. **plectocarpum**

Northern Territory and Western Australia, not in Queensland.

R. plectocarpum subsp. **tanumbirinense** (Maiden) Pedley, **comb. et stat. nov.**

Acacia tanumbirinensis Maiden in Ewart & Davis, Fl. N. Territory: 338 (1917).

Racosperma podalyriifolium (Cunn. ex G.Don) Pedley, **comb. nov.**

Acacia podalyriifolia Cunn. ex G.Don, Gen. Hist. 2: 405 (1832).

Racosperma polifolium (Pedley) Pedley, **comb. nov.**

Acacia polifolia Pedley, Austrobaileya 1: 294 (1980).

Racosperma polyadenium Pedley, Austrobaileya 2: 322 (1987).

Racosperma polybotryum (Benth.) Pedley, **comb. nov.**

Acacia polybotrya Benth., London J. Bot. 1: 384 (1842).

Racosperma polystachyum (Cunn. ex Benth.) Pedley, **comb. nov.**

Acacia polystachya Cunn. ex Benth., London J. Bot. 1: 376 (1842).

Racosperma pravifolium (F.Muell.) Pedley, **comb. nov.**

Acacia pravifolia F.Muell., Fragm. 1: 4 (1858).

Racosperma pruinatum (Cunn. ex Benth.) Pedley, **comb. nov.**

Acacia pruinosa Cunn. ex Benth., London J. Bot. 1: 383 (1842).

Racosperma pubicostum (C.White) Pedley, **comb. nov.**

Acacia pubicosta C.White, Proc. Roy. Soc. Queensland 50: 73 (1939).

Racosperma pubifolium (Pedley) Pedley, **comb. nov.**

Acacia pubifolia Pedley, Proc. Roy. Soc. Queensland 74: 59 (1964).

Racosperma pubirhachis (Pedley) Pedley, **comb. nov.**

Acacia pubirhachis Pedley, Contr. Queensland Herb. 15: 15 (1974).

Racosperma purpureipetalum (Bailey) Pedley, **comb. nov.**

Acacia purpureapetala Bailey, Queensland Agric. J. 15: 780 (1905).

Racosperma quadrilaterale (DC.) Pedley, **comb. nov.**

Acacia quadrilateralis DC., Prodr. 2: 451 (1825).

Racosperma ramiflorum (Domin) Pedley, **comb. nov.**

Acacia ramiflora Domin, Biblioth. Bot. 89: 260 (1926).

Racosperma ramulosum (W.V.Fitzg.) Pedley, **comb. nov.**

Acacia ramulosa W.V.Fitzg., J. Western Australian Nat. Hist. Soc. 2: 15 (1905).

Racospermum resinicostatum (Pedley) Pedley, **comb. nov.**

Acacia resinicostata Pedley, Contr. Queensland Herb. 15: 1 (1974).

Racosperma retiveneum (F.Muell.) Pedley, **comb. nov.**

Acacia retivenea F.Muell., Fragm. 3: 128 (1863).

Racosperma rhodoxylon (Maiden) Pedley, **comb. nov.**

Acacia rhodoxylon Maiden, J. & Proc. Roy. Soc. New South Wales 53: 223 (1920).

- Racosperma rigens** (Cunn. ex G.Don) Pedley, **comb. nov.**
Acacia rigens Cunn. ex G.Don, Gen. Hist. 2: 403 (1832).
- Racosperma rothii** (Bailey) Pedley, **comb. nov.**
Acacia rothii Bailey, Queensland Agric. J. 6: 39 (1900).
- Racosperma rubidum** (Cunn.) Pedley, **comb. nov.**
Acacia rubida Cunn. in Field, Geogr. Mem. New South Wales: 344 (1825).
- Racosperma ruppii** (Maiden & Betche) Pedley, **comb. nov.**
Acacia ruppii Maiden & Betche, Proc. Linn. Soc. New South Wales 37: 244 (1912).
- Racosperma salicinum** (Lindley) Pedley, **comb. nov.**
Acacia salicina Lindley in Mitchell, Three Exped. Australia 2: 20 (1838).
- Racospermum salignum** (Labill.) Pedley, **comb. nov.**
Mimosa saligna Labill., Nov. Holl. Pl. 2: 86 (1806).
- Racosperma saxicola** (Pedley) Pedley, **comb. nov.**
Acacia saxicola Pedley, Contr. Queensland Herb. 4: 4 (1969).
- Racosperma semilunatum** (Maiden & Blakely) Pedley, **comb. nov.**
Acacia semilunata Maiden & Blakely, Proc. Roy. Soc. Queensland 38: 11 (1927).
- Racosperma semirigidum** (Maiden & Blakely) Pedley, **comb. nov.**
Acacia semirigida Maiden & Blakely, Proc. Roy. Soc. Queensland 38: 116 (1927).
- Racosperma shirleyi** (Maiden) Pedley, **comb. nov.**
Acacia shirleyi Maiden, J. & Proc. Roy. Soc. New South Wales 53: 218 (1920).
- Racosperma simsii** (Benth.) Pedley, **comb. nov.**
Acacia simsii Benth., London J. Bot. 1: 368 (1842).
- Racosperma sophorae** (Labill.) Martius, Hort. Reg. Monac. Semin. (1835).
- Racosperma spanium** (Pedley) Pedley, **comb. nov.**
Acacia spania Pedley, Austrobaileya 1: 140 (1978).
- Racosperma sparsiflorum** (Maiden) Pedley, **comb. nov.**
Acacia sparsiflora Maiden, J. & Proc. Roy. Soc. New South Wales 53: 221 (1920).
- Racosperma spectabile** (Cunn. ex Benth.) Pedley, **comb. nov.**
Acacia spectabilis Cunn. ex Benth., London J. Bot. 1: 383 (1842).
- Racosperma spirorbe** (Labill.) Pedley, **comb. nov.**
Acacia spirorbis Labill., Sert. Austro-caled. 69, t.69 (1825).
- R. spirorbe** subsp. **spirorbe**
Acacia solandri subsp. *kajewskii* Pedley, Contr. Queensland Herb. 18: 21 (1975),
syn. nov.
 New Caledonia, Loyalty Is and Vanuatu, not in Australia.
- R. spirorbe** subsp. **solandri** (Benth.) Pedley, **comb. et stat. nov.**
Acacia solandri Benth., Fl. Austral. 2: 406 (1864).
- I agree with Nielsen (1983) that *A. solandri* should be treated as a subspecies of *A. spirorbis*, and have therefore reduced it in rank.
- Racosperma spondylophyllum** (F.Muell.) Pedley, **comb. nov.**
Acacia spondylophylla F.Muell., Fragm. 8: 243 (1874).
- Racosperma stenophyllum** (Cunn. ex Benth.) Pedley, **comb. nov.**
Acacia stenophylla Cunn. ex Benth., London J. Bot. 1: 366 (1842).

Racosperma stipuligerum (F.Muell.) Pedley, **comb. nov.**

Acacia stipuligera F.Muell., J. Proc. Linn. Soc., Bot. 3: 144 (1859).

R. stipuligerum subsp. **stipuligerum**

Northern Territory, not in Queensland.

R. stipuligerum subsp. **glabrifolium** (Maiden & Blakely) Pedley, **stat. nov.**

Acacia stipuligera var. *glabrifolia* Maiden & Blakely, Proc. Roy. Soc. Queensland 38: 120 (1927).

Racosperma storyi (Tindale) Pedley, **comb. nov.**

Acacia storyi Tindale, Proc. Linn. Soc. New South Wales 91: 147 (1966).

Racosperma stowardii (Maiden) Pedley, **comb. nov.**

Acacia stowardii Maiden, J. & Proc. Roy. Soc. New South Wales 51: 269 (1917).

Racosperma striatifolium (Pedley) Pedley, **comb. nov.**

Acacia striatifolia Pedley, Austrobaileya 1: 141 (1978).

Racosperma strictum (Andr.) Martius, Hort. Reg. Monac. Semin. (1835).

Racosperma strongylophyllum (F.Muell.) Pedley, **comb. nov.**

Acacia strongylophyllum F.Muell., Fragm. 8: 226 (1874).

Racosperma suaveolens (Smith) Martius, Hort. Reg. Monac. Semin. (1835).

Racospermum tenuinerve (Pedley) Pedley, **comb. nov.**

Acacia tenuinervis Pedley, Austrobaileya 1: 142 (1978).

Racosperma tenuissimum (F.Muell.) Pedley, **comb. nov.**

Acacia tenuissima F.Muell., J. Proc. Linn. Soc., Bot. 3: 135 (1859).

Racosperma tephrium (Pedley) Pedley, **comb. nov.**

Acacia tephria Pedley, Austrobaileya 1: 342 (1981).

Racosperma tetragonophyllum (F.Muell.) Pedley, **comb. nov.**

Acacia tetragonophylla F.Muell., Fragm. 4: 3 (1863).

Racosperma tindaleae (Pedley) Pedley, **comb. nov.**

Acacia tindaleae Pedley, Austrobaileya 1: 248 (1980).

Racosperma torulosum (Benth.) Pedley, **comb. nov.**

Acacia torulosa Benth., J. Proc. Linn. Soc., Bot. 3: 139 (1859).

Racosperma translucens (Cunn. ex Hook.) Pedley, **comb. nov.**

Acacia translucens Cunn. ex Hook., Icon. Pl. 2: t.160 (1837).

Racosperma tripterum (Benth.) Pedley, **comb. nov.**

Acacia triptera Benth., London J. Bot. 1: 325 (1842).

Racosperma tropicum (Maiden & Blakely) Pedley, **comb. & stat. nov.**

Acacia cunninghamii Hook. var. *tropica* Maiden & Blakely, J. & Proc. Roy. Soc. Western Australia 13: 31 (1928).

Racosperma ulicifolium (Salisb.) Pedley, **comb. nov.**

Mimosa ulicifolia Salisb., Prod. Stirp. Chap. Allerton 324 (1796).

Racosperma umbellatum (Cunn. ex Benth.) Pedley, **comb. nov.**

Acacia umbellata Cunn. ex Benth., London J. Bot. 1: 378 (1842).

Racosperma unciferum (Benth.) Pedley, **comb. nov.**

Acacia uncifera Benth. in Mitchell, J. Exped. Trop. Australia: 341 (1848).

Racospermum uncinatum (Lindley) Pedley, **comb. nov.***Acacia uncinata* Lindley, Bot. Reg. 16: t.1332 (1830).**Racosperma venulosum** (Benth.) Pedley, **comb. nov.***Acacia venulosa* Benth., London J. Bot. 1: 366 (1842).**Racosperma vernicifluum** (Cunn.) Pedley, **comb. nov.***Acacia verniciflua* Cunn. in Field, Geogr. Mem. New South Wales: 344 (1825).**Racosperma victoriae** (Benth.) Pedley, **comb. nov.***Acacia victoriae* Benth. in Mitchell, J. Exped. Trop. Australia: 333 (1848).**Racosperma viscidulum** (Benth.) Pedley, **comb. nov.***Acacia viscidula* Benth., London J. Bot. 1: 363 (1842).**Racosperma wardellii** (Tindale) Pedley, **comb. nov.***Acacia wardellii* Tindale, Contr. New South Wales Natl. Herb. 4: 139 (1970).**Racosperma whitei** (Maiden) Pedley, **comb. nov.***Acacia whitei* Maiden, Proc. Roy. Soc. Queensland 30: 35 (1918).**Racosperma wickhamii** (Benth.) Pedley, **comb. nov.***Acacia wickhamii* Benth., London J. Bot. 1: 377 (1842).**Acknowledgement**

I am grateful to Mr A.D.Chapman, Bureau of Flora and Fauna, Canberra who made available to me part of his *Australian Plant Name Index*. Without it the compilation of a list such as this would have been much more difficult than it proved to be.

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RACOSPERMA MARTIUS (LEGUMINOSAE: MIMOSOIDEAE) IN NEW ZEALAND: A CHECKLIST

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Summary

Thirteen species of *Racosperma* Martius are naturalised in New Zealand and one is widely cultivated. These species, which were all formerly referred to *Acacia* Miller, are listed. New combinations are made for five of them, and for one variety.

The recognition of *Racosperma* Martius as a genus distinct from *Acacia* Miller (Pedley 1986) necessitates the transfer of many taxa to *Racosperma*. A few new combinations were made by Martius in his validation of the name *Racosperma* (Martius 1835), and combinations for Queensland taxa are made in this volume (Pedley 1987), but a considerable number are still required.

Thirteen species of *Racosperma* are naturalised in New Zealand and one is widely cultivated (Webb 1980 & in litt. 1986). These are listed below.

Naturalised Species

Racosperma baileyianum (F.Muell.) Pedley, *Austrobaileya* 2: 345 (1987).

Racosperma dealbatum (Link) Pedley, **comb. nov.**

Acacia dealbata Link, Enum. Hort. Berol. Alt. 2: 445 (1822).

Racosperma decurrens (Willd.) Pedley, **comb. nov.**

Acacia decurrens Willd., Sp. Plant. ed.4. 4: 1072 (1806).

Racosperma elatum (Cunn. ex Benth.) Pedley, **comb. nov.**

Acacia elata Cunn. ex Benth., London J. Bot. 1: 383 (1842).

Racosperma floribundum (Vent.) Pedley, *Austrobaileya* 2: 348 (1987).

Racosperma longifolium (Andr.) Martius, Hort. Reg. Monac. Semin. (1835).

Racosperma mearnsii (De Wild.) Pedley, **comb. nov.**

Acacia mearnsii De Wild., Pl. Bequaert. 3: 61 (1925).

Racosperma melanoxylon (R.Br.) Martius, Hort. Reg. Monac. Semin. (1835).

Racosperma paradoxum (DC.) Martius, Hort. Reg. Monac. Semin. (1835).

Racosperma parramattense (Tindale) Pedley, **comb. nov.**

Acacia parramattensis Tindale, Contr. New South Wales Natl. Herb. 3: 127 (1962).

Racosperma podalyriifolium (Cunn. ex G.Don) Pedley, *Austrobaileya* 2: 354 (1987).

Racosperma sophorae (Labill.) Martius, Hort. Reg. Monac. Semin. (1835).

Racosperma verticillatum (L'Herit.) Martius, Hort. Reg. Monac. Semin. (1835).

R. verticillatum* var. *verticillatum

R. verticillatum* var. *latifolium Pedley, **nom. nov.**

Acacia verticillata var. *latifolia* Benth., Linnaea 26: 611 (1855) **nom. illeg.** non *A. verticillata* var. *latifolia* DC., Prodr. 2: 454 (1825) quae est *Racosperma ulicifolium* (Salisb.) Pedley.

Cultivated Species

Racosperma pravissimum (F.Muell. ex Benth.) Pedley, **comb. nov.**

Acacia pravissima F.Muell. ex Benth., *Linnaea* 26: 608 (1855).

Acacia pravissima F.Muell., First Gen. Report 12 (1853), *nomen nudum*.

Acknowledgements

I am grateful to Dr Colin J. Webb, DSIR, Christchurch, New Zealand for making available his list of taxa naturalised in New Zealand; and to Mr Arthur D. Chapman, Bureau of Flora & Fauna, Canberra whose *Australian Plant Names Index* has been of great help in finding places of publication.

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REDISCOVERY AND STATUS OF *ADIANTUM WHITEI* BAILEY (ADIANTACEAE)

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Summary

Adiantum whitei Bailey (Adiantaceae), formerly recorded from a few localities in south-eastern Queensland, is now known to have a wider range in north-eastern Australia. The receptacle of this taxon bears thick-walled trichomes, a condition not previously reported for the genus. *A. whitei* is reduced to varietal status under *A. hispidulum* Sw.

The original collections of *Adiantum whitei* were from Kenmore, a western suburb of Brisbane. Other contemporary collections came from the nearby suburbs of Indooroopilly and Enoggera, Lawnton (One Mile Creek) ca 16 km north of Brisbane and Maryborough ca 215 km north of Brisbane. The last collection (other than cultivated specimens) appears to have been from Kenmore in December 1931 (AQ142926, BRI).

Recent collections of *Adiantum* taxa include a robust tripinnate fern collected 9 km SW of the type locality (State Forest 494 Moggill, Bostock 190, BRI) which matches one of the syntypes of *A. whitei* (Kenmore, May 1915, White AQ24496 (BRI)). A collection from ca 6 km NE of the type locality was subsequently propagated from its spores (R.Hill, pers.comm.). The descendants have been distributed under the horticultural names *Adiantum* aff. *whitei* and *Adiantum* sp. 'S.E. Qld'. More recently *A. whitei* has been found to be common along creeks in the southern and western parts of Brisbane and specimens now in cultivation in Brisbane are reputed to have come from as far afield as Mt Spec ca 1500 km north of Brisbane (C.Ritchie, pers. comm.).

A revised description of *A. whitei* is given here, based on specimens examined by the author.

Rhizome short-creeping, semi-erect, stoloniferous; scales concolorous, with entire margins and acuminate apex. Fronds approximate, occasionally remote, to 60 cm long. Lamina to 30 cm long, 20 cm broad, triangular, 2- to 3-pinnate, herbaceous to coriaceous. Rachides invested with antrorse red-brown hairs. Pinnae numerous, narrow-triangular, simply pinnate in their apical half. Ultimate segments symmetric and cuneate-flabellate becoming dimidiate and rectangular to trapeziform towards apices of pinnae and lamina; distal margins shallowly lobed, dentate when sterile; segment surfaces invested with numerous short pale trichomes (to ca 0.4 mm long) and a few similar but longer ones, denser abaxially. Indusia crowded, 1 to 4 per lobe, oblong to subrectangular, joining the segment margin proper at a narrow sinus, bearing on their outer surface numerous dark brown uniseriate thick-walled trichomes, which are also scattered among the sporangia. Spores with minutely granulate perine adhering rather loosely to the exine. **Fig. 1.**

Recent authors (Jones & Clemesha 1981, Elliot & Jones 1982, Goudey 1985) have speculated that *A. whitei* is a hybrid. Jones and Clemesha (1981) and Goudey (1985) proposed *A. hispidulum* Sw. and *A. formosum* R.Br. as putative parents. Little evidence is offered in support of this statement, although Goudey (1985) lists a number of morphological characters of *A. whitei* which are common to one or other of these species.

In his original description and accompanying illustration, Bailey describes the rhizome of *A. whitei* as 'creeping'. Investigation of the new collections has shown that the 'creeping' rhizome is a stoloniferous branch that on occasion bears fronds spaced a few centimetres apart. The apices of mature stolons bear a tuft of fronds indicating reversion to a short-creeping rhizome. In this respect, the rhizome ramification of *A. whitei* is similar to that of both *A. hispidulum* and *A. aethiopicum* L., another taxon

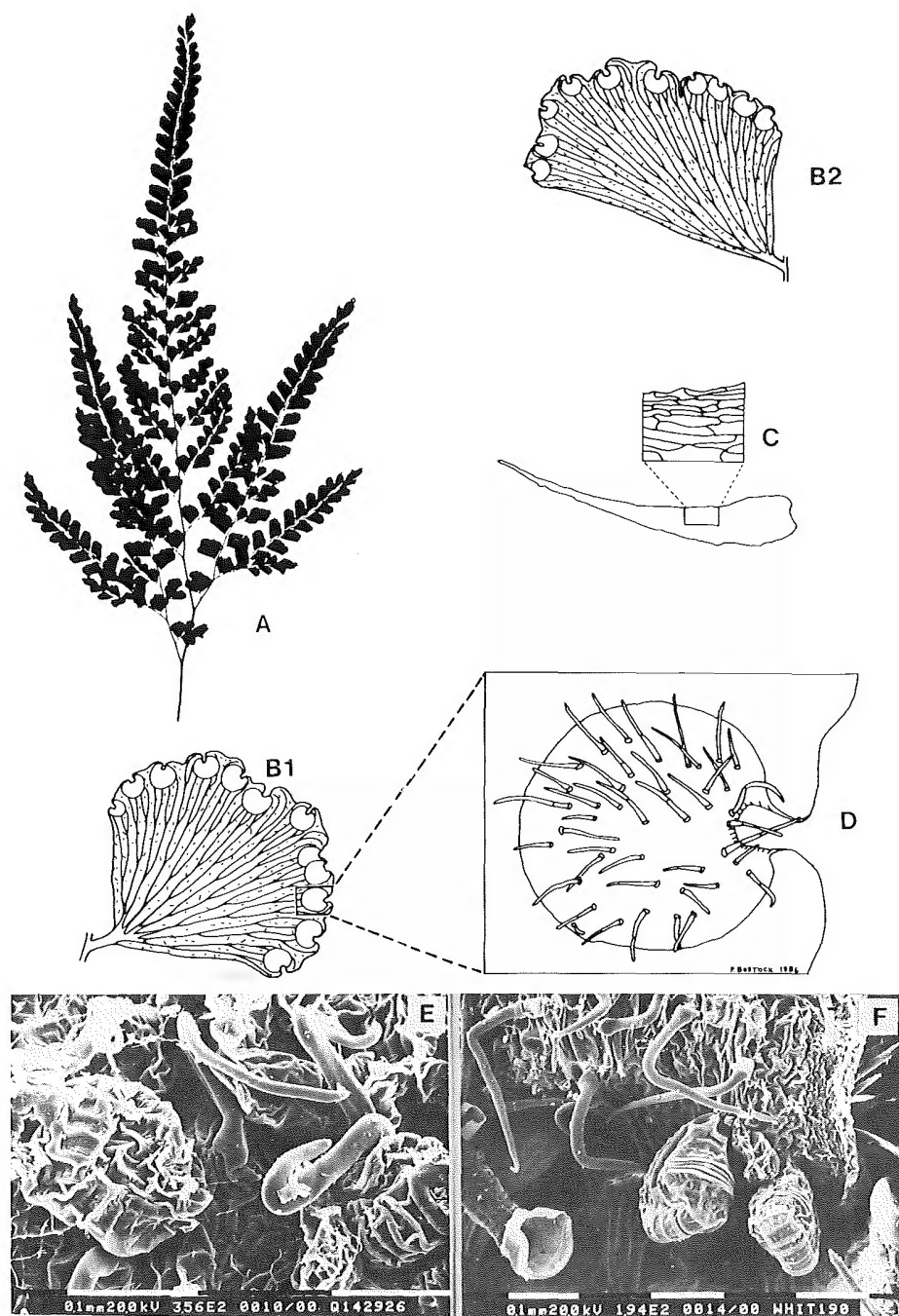


Fig. 1. *Adiantum whitei*: A. silhouette of frond (Bostock 218) $\times 0.4$. B. ultimate segments (middle of frond) (Bostock 190) $\times 3.5$. C. indusium (Bostock 190) $\times 40$. D. rhizome palea (Bostock 246) $\times 35$. E & F. scanning electron micrographs of abaxial indusial surface. E. Blake, Dec 1931, AQ142926. F. Bostock 190. (scale for E and F indicated on plates.)

widespread in eastern Australia, but differs markedly from the robust much-branched system of *A. formosum*. The symmetric and cuneate-flabellate ultimate segments of *A. whitei* are reminiscent of those of *A. formosum* and *A. aethiopicum*. However, *A. hispidulum* also bears segments of a similar form, as in the small accessory pinnae between the major bifurcations of the rachides in pedate forms, or in many (sometimes the majority) of the ultimate segments in pinnate forms. *A. hispidulum sens. lat.*, which is found from eastern Africa, through India and Malesia to Australia and the western Pacific (Parris 1980), is a variable taxon. The form which occurs in drier areas in north-eastern Australia has pedate, sub-pedate or pinnate-bipinnate fronds, with texture and indumentum of the lamina as described above for *A. whitei*. It is this form which occurs in areas where *A. whitei* has been collected, and which is referred to in the remainder of this discussion. The range of frond forms which occur in *A. whitei* and *A. hispidulum* are shown as silhouettes in Fig. 2.

Indusia of *A. whitei* (Fig. 1C) are morphologically identical to those of *A. hispidulum* in shape, location on the segment and nature of the trichomes investing the outer surface. Additionally, most specimens of *A. whitei* have been found to possess hook-shaped trichomes among the sporangia (Fig. 1E-F). Indusia of *A. hispidulum* occasionally bear trichomes just under their margins but trichomes have not been found to arise from receptacular tissue. The genus *Adiantum* is usually recorded as non-paraphysate (e. g. Tryon & Tryon 1982), although Nayar (1961) recorded club-shaped paraphyses for material identified as *A. tenerum* Sw. The observation of receptacular trichomes reported here is the first for the genus, and may be regarded as diagnostic of the taxon regarded as *A. whitei*.

A. whitei and *A. hispidulum* cannot be separated by using any of the following characters: rhizome scales (*A. whitei*, Fig. 1D); lamina texture; rachis indumentum or texture; spore ornamentation; rate of spore germination (tested at room temperature (12–24°C) with indirect natural lighting). They have similar ecological requirements, and are generally found in close proximity, although *A. whitei*, which grows mainly in the vicinity of watercourses appears to be less tolerant of dry conditions than *A. hispidulum*, which is often found in relatively sheltered places considerably distant from streams.

On the basis of the above evidence, *A. whitei* Bailey is here reduced to the status of a variety of *A. hispidulum* Sw.

***Adiantum hispidulum* Sw. var. *whitei* (Bailey) P.Bostock stat. nov.**

Adiantum whitei Bailey, Queensland Agric. J., n.s. 4: 39 & t. 5 (1915). **Lectotype** (designated here): Kenmore, Qld, May 1915, *White* AQ24496 (lecto: BRI; isolecto: NSW).

Specimens Examined. Queensland. MORETON DISTRICT: Kenmore, May 1914, *White* AQ142924; Kenmore, Jul 1914, *Young & White* AQ142928; Enoggera, May 1916, *White* AQ142927; Brisbane R., Indooroopilly, Feb 1916, *Young & White* AQ142929; One Mile Ck, Lawnton, *Blake* AQ142925; Kenmore, Dec 1931, *Blake* AQ142926; Maryborough district, *Young* AQ142923; University Bushhouse [Brisbane], Dec 1937, *Goy* AQ142930; S.F.494 Moggill, Brisbane, *Bostock* 159, 184, 189, 190, 218, 246, 252; garden plant, The Gap, Apr 1986, *Bostock* 225; cultivated plant ex Mt Spec, NNW Townsville, Apr 1986, *Ritchie* s.n.; cultivated plant ex base of Mt Petrie, Brisbane, Apr 1986, *Peach* s.n. (all BRI).

Agamospory in the *A. hispidulum* complex

The source of taxonomic confusion in many fern species may be shown to result from agamospory. Thus the spores contain the unreduced parental chromosome complement and sporophytes arise directly from gametophytic tissue. Archegonia are absent from the gametophytes although functional antheridia are usually present (Walker 1983). This is the situation with *Adiantum caudatum* L. *sens. strict.*, which is a member of a complex consisting of at least seven taxa (Lovis 1977).

Agamospory has also been reported as the normal state in *A. hispidulum* (Manton & Sledge 1954, Abraham et al. 1962, Ghatak 1977, Bidin 1983). The sole exception is Brownlie (1957, 1965) who reported only meiotic chromosome counts. At least 4 cytotypes have been identified in *A. hispidulum* (Walker 1983), but detailed studies linking morphology and cytology in the taxon are not available.



Fig. 2. Silhouettes (not to scale) showing frond forms in *Adiantum whitei* and *A. hispidulum* in Queensland: A-C. *A. whitei* sens. str. A. Bostock 190. B. Bostock 218. C. cultivated ex Mt Spec, NNW of Townsville, Richie s.n. D-H. *A. hispidulum* sens. lat. D. Bostock 235. E. Bostock 251. F. Bostock 245. G. Bostock 250. H. Bostock 151.

In all investigated cases of hybrids between apomicts and sexual species (where the apomict must be the male or antheridial parent), the offspring have been apomictic (Walker 1979, 1983, 1985). The production of fertile spores by *A. whitei* is not unexpected, even if the taxon should prove to be a natural hybrid between *A. hispidulum* and another (sexually reproducing) *Adiantum* taxon. Walker (1985) commented on the ability of agamosporous taxa to build up extensive agamic complexes in this manner and the possibility that *A. whitei* has its origins in such an event (or events) cannot be discounted.

The numerous morphological similarities between *A. hispidulum* and *A. whitei* indicate a common ancestry, but the latter taxon is sufficiently distinguished by virtue of its frond dissection and receptacular trichomes to be given varietal status.

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REVISION OF THE AUSTRALIAN VITACEAE, 2. *CAYRATIA* JUSS.

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Summary

The genus *Cayratia* Juss. is reviewed for Australian species. Two species *C. maritima* and *C. cardiophylla* are described as new. A description of the genus and of each of the eight species occurring in Australia is given, together with a key to the species.

CAYRATIA

Cayratia Juss. Dict. Sci. Nat. 10: 103 (1818), nom. cons., Dict. Class. Hist. Nat. 4: 346 (1823); Gagnepain, Notul. Syst. 1: 346 (1911).

Columella Loureiro, Fl. Cochinch. 85 (1790); Merrill, Enum. Philip. Plants 3 (1923), nom. rej.

Cissus sect. *Cayratia* (Juss.) Planchon in A. & C. DC. Monogr. Phan. 5: 47 (1887).

Type: *Cayratia pedata* (Loureiro) Jussieu ex Gagnepain.

Climbing or scrambling vines, slender, evergreen or deciduous, underground system sometimes tuberous. Tendrils leaf-opposed, often branched several times, each branch subtended by a bract. Leaves alternate, compound, 3-5-foliolate, pinnate or pedate, margins usually serrated. Stipules 2, caducous. Degree and type of pubescence on aerial parts varies between species. Inflorescence axillary, pseudoaxillary or leaf-opposed, pedunculate, carried above the leaves, multiflowered in irregular corymbose cymes, often loose; peduncles and pedicels subtended by bracts. Flowers bisexual, small, tetramerous, pedicellate, buds often swollen. Calyx cup-shaped or margins sometimes spreading. Corolla with 4 free lobes, cohering in bud by the interlocked epidermal cells, sometimes cucullate at the apex, reflexed after anthesis. Stamens inserted on the receptacle at the base of the disc, opposite the petals, filaments erect, often flattened, anthers introrse, dorsifixed opening by longitudinal slits. Pollen grains tricolporate. Disc adnate to and entirely surrounding the ovary, the 4 rounded lobes sometimes extending above the ovary. Ovary 2-locular with 2 anatropous, basally attached ovules per locule; style conical, stigma minute, expanding after anthesis. Berry fleshy with 1-4 triangular to ovoid seeds. Shape of seeds in transverse section varies according to the number maturing in the fruit, the flattened area on the dorsal surface formed by the perichalaza may be rounded or elongate, 1 or 2 furrows or pits are present on the ventral surface. Endotesta lignified sometimes with lateral flanges, endosperm ruminations in transverse section may be T-shaped or U-shaped. Mucilage cells and raphide sacs also often with mucilage, appear to be present in all organs.

Cayratia may be distinguished from the closely related genus *Cissus* by the following characters: leaves compound, petiolules associated with the leaflets, ratio central petiolule to lateral petiolule rarely less than 2; inflorescence a dichotomous cyme, usually axillary or pseudoaxillary by the abortion of the lateral axis; endosperm in transverse section either T-shaped or U-shaped. Two of the characters by which Gagnepain (1911) and Latiff (1981) separated these two genera are not valid for Australian species. They considered that in *Cissus* the leaves are always simple and the berry is 1-seeded. Although leaf size, margin indentation and degree of pubescence exhibit considerable intraspecific variation, number of leaflets, shape and relative size, position of hairs, nature of the tendrils and seed characteristics are useful diagnostic characters. All measurements and observations in this paper refer to dried mature organs unless otherwise indicated.

According to Galet (1967) there are about 63 species most of which occur in the tropical and subtropical areas of Africa, Asia, Australia and many of the Pacific Islands.

Eight species occur in Australia, three are endemic, and two are endemic to Australia and adjacent areas of New Guinea. The species in Australia fall into three separate groups distinguished by leaf, fruit and seed characters.

Key to the Species

1. Leaflets 3 2
 Leaflets 5 6
2. Mature fruit purple to black drying black 3
 Mature fruit pale drying brown 4
3. Tendrils 3-fid, hooked hairs restricted to midrib on adaxial surface .. 1. *C. maritima*
 Tendrils 4–5-fid, adhesive disc present on branch tips, hairs not restricted 2. *C. trifolia*
4. Abaxial surface of mature leaf glabrous 3. *C. saponaria*
 Abaxial surface of mature leaf pubescent 5
5. Flowering occurs on young shoots. Length/breadth ratio of central leaflet
 0.96 ± 0.12 4. *C. cardiophylla*
 Flowering occurs on branches with fully expanded leaves. Length/breadth
 ratio of central leaflet 1.47 ± 0.4 5. *C. acris*
6. Base of central leaflet oblique. Filaments broad. Length/breadth ratio *ca*
 3:2 6. *C. eury nema*
 Base of central leaflet rounded or cuneate. Filaments narrow. Length/breadth
 ratio *ca* 4:1 7
7. Inflorescence axillary. Apex of corolla cucullate. Base of central leaflet
 rounded. Stipules usually less than 4 mm 7. *C. japonica*
 Inflorescence leaf-opposed, or pseudoaxillary. Apex of corolla not cucullate.
 Base of central leaflet usually cuneate. Stipules longer than
 4 mm 8. *C. clematidea*

1. *Cayratia maritima* B.R.Jackes, *sp. nov.* affinis *C. trifoliae* (L.) Domin foliis maturitate glabris praeter paginam adaxialem qua costa compressa verticaliter pilos multicellulares uniseriatis feret, cirrhis 3-fidis sine discis adhaerentis ad apices distinguatur. **Typus:** Lakefield, 15°07'S, 144°17'E, 26 Jun 1982, B.R.Jackes 'growing over shrub beside billabong. Alluvial. Luxuriant vine, fruits black, flowers greenish' (holo: BRI; iso: A,CANB,DNA,K,L,MEL, NSW).

*Vitis carnos*a Wall. Cat. 6018 (K).

Frutex ramis angularis plerumque glabris pilis simplicibus ad nodos praeditis, raro deciduus, si ita per intervallum breve non nisi in meridionale limitate. Tuber quum adest breve. Capreoli 3 fidi glabri. Folia trifoliolata; foliolum medium ovatum usque rhomboideum, apice acuminate, 7.2 cm × 3.8 cm; foliola lateralia obliqua interdum loba 5.1 cm × 3.3 cm, marginibus crenulato-serratis, pagina supra glabra maturitate praeter costam verticaliter compressam pilos simplices uniseriatis 3–4 cellulares uncinatos ferentem, pagina inferne plerumque glabra, aliquando pilis uncinatis in venis prope junctionem petioli laminaeque; petiolulus medius supra porcatus, plerumque pilis uncinatis (1–)1.5(–4) cm longis; petioluli laterales (0.2–)0.5(–1.2) cm longi; petiolus (2–)3.5(–6.8) cm longus. Stipulae triangulares 1.5–2 mm longae. Inflorescentia supra folia portata cymosa corymbiformis 6.5 cm × 4 cm, pedunculo (3–)4(–8) cm longo. Calyx papillosus; corolla papillosa pallide viridis usque alba usque flavida 2 mm × 2 mm; filamenta

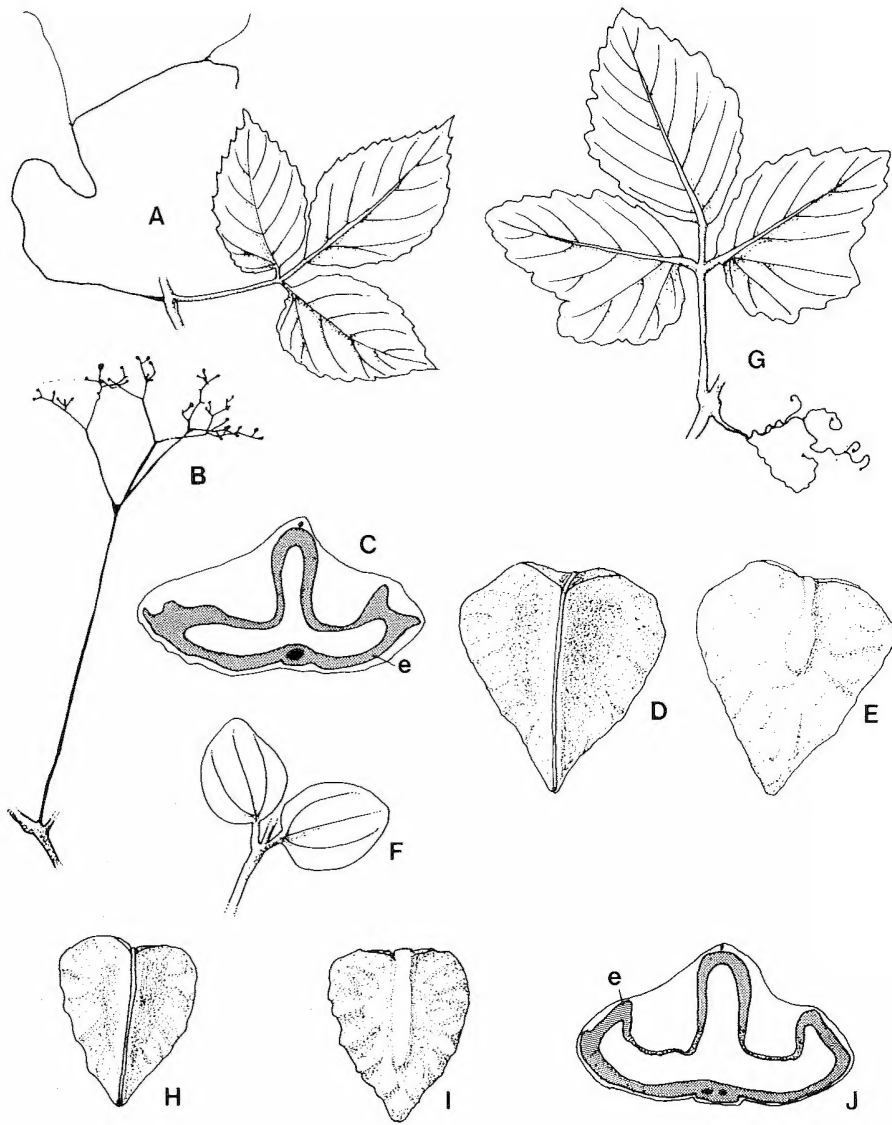


Fig. 1. *Cayratia maritima*: A. leaf and tendril with three branches $\times 0.5$. B. inflorescence $\times 0.5$. C. median transverse section of mature seed $\times 7.5$. D. seed, ventral surface showing position of the raphe $\times 5$. E. seed, dorsal surface showing the position and shape of the perichalaza $\times 5$. F. cotyledons $\times 0.5$. *C. trifolia*: G. leaf and tendril with five branches $\times 0.5$. H. seed, ventral surface showing position of the raphe $\times 5$. I. seed, dorsal surface showing position and shape of the perichalaza $\times 5$. J. median transverse section of mature seed $\times 10$ (e - lignified endotesta.).

staminalia 1–1.5 mm longa; antherae 0.5 mm longae. Bacca nigra, depresso-globula, 1.2–1.5 cm × 0.6–1 cm, 2–4 seminibus naviculiformis 5.5–7 mm × 5–7 mm, a ventre sulcis duobus vadosis notatis; endospermium T-forme in sectione transversali.

Scrambling vine, stems angular, usually glabrous, simple hairs at nodes when young. Tendrils 3-fid, glabrous. Plant rarely deciduous, if so, for a short period only on the southern limits. Tuber if present, small. Leaves trifoliate. Central leaflet ovate to rhomboid, apex acuminate (3–)7.2(–10.5) cm × (2.2–)3.8(–6) cm; lateral leaflets oblique, sometimes lobed (2.5–)5.1(–7.6) cm × (1.9–)3.3(–4.3) cm. Margins crenulate-serrate. Upper surface glabrous at maturity except for the vertically compressed midrib which bears uniseriate 3–14-celled hooked hairs. Lower surface usually glabrous, occasionally hooked hairs are present on veins near the junction of the petiole and lamina. Central petiolule ridged on top, hooked hairs usually present, (1–)1.5(–4) cm long; lateral petiolule (0.2–)0.5(–1.2) cm long. Petiole (2–)3.5(–6.8) cm long. Stipules triangular 1.5–2 mm long. Inflorescence axillary, 3–5 primary branches, cymose, corymbiform (5–)6.5(–15) cm × (3.5–)4(–10) cm, peduncle (3–)4(–8) cm long. Calyx papillose. Corolla papillose, pale green to white to yellowish, 2 mm × 2 mm. Filaments 1–1.5 mm long, anthers 0.5 mm long. Berry black, depressed-globular, 1.2–1.5 cm × 0.6–1 cm. Seeds 2–4 per fruit, boat-shaped, 5.5–7 mm × 5–7 mm; 2 shallow grooves on the ventral surface, endosperm in transverse section T-shaped. **Figs. 1A–F, 2A.**

Representative Specimens Examined. Northern Territory. South of Bushman's Camp and north of Channel Point, mouth of Daly River, 13°15'S, 129°58'E, May 1978, *Webb & Tracey* 12230 (BRI,CANB); Mardlow, Melville Island, Apr 1967, *Stocker & Fox* (BRI,QRS); Near Cahill's Crossing, East Alligator River, 12°30'S, 133°00'E, May 1978, *Webb & Tracey* 12231 (BRI,CANB). Queensland. COOK DISTRICT: Saibai, Jul 1975, *Stocker* 1365 (QRS); Kerr Point, Weipa, Jun 1982, *Jacks* (BRI,CBG,PERTH,QRS); Normanby River, Aug 1979, *Done* (BRI); Cairns Central Swamp, Feb 1979, *Wright* (BRI,K,L,NSW).

Specimens from 38 Australian localities were examined.

Distribution and Habitat: This vine is commonly found growing along tropical coastlines (**Map 1.**) and adjacent areas which are seasonally inundated as well as around lagoons and along creek banks. It extends into Indonesia, New Guinea and neighbouring Pacific Islands. Soils are usually alluvial or sandy.

Flowering period: spring to summer.

Fruiting period: summer to winter.

Notes and Observations: This species is readily distinguished from the related *C. trifolia* by the 3-fid tendrils which lack adhesive pads at the apices and by the mature leaves which are glabrous except for hooked hairs on the adaxial midrib. Leaves usually dry dark grey.

2. *Cayratia trifolia* (L.) Domin, Biblioth. Bot. 89: 370 (1927).

Vitis trifolia L., Spec. Pl. 203 (1753); Benth., Fl. Austral. 1: 449 (1863); F.Muell., Fragm. 6: 177 (1868), 9: 126 (1875); F.M.Bailey, Qd Fl. 1: 281 (1899).

Cissus trifolia (L.) K.Schum. in Schum. et Holtr., Fl. Kaiser Wilh. Land 71 (1889); Warburg, Bot. Jahrb. Syst. 13: 369 (1891).

Columella trifolia (L.) Merrill, Philipp. J. Sci. 11: 132 (1916).

Cissus acutifolia Poir., Encycl. Suppl. 1: 106 (1810); DC. Prodr. 1: 630 (1824).

Cissus carnosa Lamk. Encycl. 1: 31 (1783); Planchon in A. & C.DC., Monogr. Phan. 5: 570 (1887); DC., Prodr. 1: 630 (1824); Roxb., Fl. Ind. 1: 427 (1820).

Cissus cinerea Lamk., Tabl. Encycl. 1: 332 (1791); DC., Prodr. 1: 631 (1824). **Type:** Lamk. Herb. (P).

Cissus crenata Vahl, Symb. Bot. 3: 19 (1794); Wall. Cat. 6021 (K) (1831–32).

Cissus obtusifolia Poir., Encycl. Suppl. 1: 106 (1810); Lamk., Encycl. 1: 31 (1783). **Type:** Herb. Lamk. (P).

Vitis psoralifolia F.Muell., Fragm. 2: 75 (1860). **Type:** Victoria River (K,GH,MEL).

Cissus psoralifolia (F.Muell.) Planchon in A. & C.DC. Monogr. Phan. 5: 567 (1887), based on *V. psoralifolia*.

Cayratia carnosa (Lamk.) Gagnep. in Lecomte, Notul. Syst. (Paris) 1: 347 (1911), based on *Cissus carnosa* Lamk.

Weak climber, frequently clinging to trees, stems angular, pubescent when young, hairs uniseriate 4–16-celled. Tendrils 4–5-fid, branches ending in adhesive discs, initially pubescent becoming glabrous with age. Plants usually deciduous, tubers present. Leaves trifoliolate often somewhat fleshy. Central leaflet ovate to rhomboid, apex acuminate (2.3–)5.2(–11) cm × (1.3–)3.3(–7.2) cm; lateral leaflets oblique, often lobed (1.8–)4(–9) cm × (1.1–)2.8(–5.8) cm. Margins crenulate to dentate. Upper surface pubescent often becoming glabrous with age, or hairs become restricted to the main veins, lower surface pubescent, often sparsely so when old; hairs on both surfaces curved, uniseriate 2–7-celled. Central petiolule ridged, pubescent (0.3–)1.1(–3) cm long; lateral petiolule (0.1–)0.3(–0.8) cm long. Petiole (1.2–)3.9(–7.7) cm long. Stipules triangular (2–)3(–4) mm long. Inflorescence axillary, 3–4 primary branches, cymose corymbiform (4–)7(–12) cm × (2–)4(–8) cm; peduncle (2–)4(–6.5) cm long, all parts shortly pubescent. Calyx papillose. Corolla papillose, 1.5–2 mm × 1–1.5 mm, pale green to yellowish. Filaments 1 mm long, anthers 0.5 mm long. Berry purple-black, depressed-globular 0.8–1.7 cm × 0.6–0.8 cm. Seeds 2–4 per fruit, boat-shaped, 4–6 mm × 4–4.5 mm; 2 shallow grooves on the ventral surface, endosperm in transverse section T-shaped. **Figs. 1G–J, 2B.**

Representative Specimens Examined. Western Australia. Crater Valley, 38 km NNW of Wyndham, Mar 1978, *Lazarides* 8555 (CANB,K,NT); Ord River, 2 miles [3.2 km] below Carlton Reach, May 1944, *Gardner* 7285 (PERTH). Northern Territory. Banjo Beach, Melville Island, Jan 1966, *Stockner* (BRI,NT); Gove Airport area, Feb 1977, *Hinz* 7724 (NT); Cannon Hill airstrip, Feb 1973, *Martensz* (BRI,CANB,DNA,K,L,NSW,NT); Victoria River, *Mueller* (MEL); Rapid Creek, Katherine, Jan 1943, *Hely* (CANB); 60 km W of Dunmarra, Jul 1978, *Jacks* (CANB,JCT,NSW). Queensland. COOK DISTRICT: Halfway Island, 11°23'S, 142°58'E, Feb 1979 *Duke* (JCT); 12.5 km NNE of Weipa Mission, Dec 1974, *Specht & Salt* (BRI); Base of Black Mountain, SW of Cooktown, Dec 1965, *Rodd* 219 (NSW). BURKE DISTRICT: Near Doomagee Mission on Burketown Road, Jun 1978, *Jacks* (JCT). NORTH KENNEDY DISTRICT: 45 miles [72 km] SE Mount Garnet, Jan 1968, *Morain* 279 (BRI); Collinsville–Bowen Road, Jan 1978, *Jacks* (JCT).

Specimens from 131 Australian localities were examined.

Distribution and Habitat: This species extends from India to the Pacific. In Australia it is found (**Map 2.**) chiefly in open forest in tropical regions usually climbing on trees with persistent bark. Soils are variable.

Flowering period: spring to summer.

Fruiting period: summer to autumn.

Notes and Observations: Leaf size, thickness, nature of the leaf margin and degree of pubescence are highly variable in this species. Hairs are always present on both leaf surfaces when young. Size of leaf appears to be related to habitat, those plants growing in moister, protected areas usually have the largest leaves.

3. *Cayratia saponaria* (Seem. ex Benth.) Domin in Fedde, Repert. 11: 294 (1912).

Vitis saponaria Seem. ex Benth., Fl. Austral. 1: 448 (1863). **Lectotype** (designated here): Voyage of Rattlesnake, Piper's Islets, 27 Sep 1848, *McGillivray*; **lectopara:** Torres Strait, *Brown* (E,K); Cape York, *McGillivray* (K); F.Muell., *Fragm.* 6: 178 (1868); F.M.Bailey, Qd Fl. 1: 280 (1899).

Cissus saponaria (Seem.) Planchon in A. & C.DC., Monogr. Phan. 5: 574 (1887).

Vitis strigosa F.M.Bailey, Qd Fl. 1: 281 (1899). **Type:** Ranges about Cairns, *Nugent* 124 (BRI).

Cayratia strigosa (F.M.Bailey) Domin in Fedde, Repert. 11: 264 (1912).

Cissus bicolor Domin, Biblioth. Bot. 89: 921 (1927). **Type:** Harvey's Creek, 1910, *Domin* 6373, 6374 (PR).

Robust vine, stems rounded, glabrous or with minute papillae. Tendrils bifid, papillae may be present. Leaves trifoliolate. Central leaflet ovate to broadly ovate, apex acuminate-caudate, base weakly cordate, (12–)13.9(–17.5) cm × (6.2–)10.2(–13) cm; lateral leaflets oblique (10.5–)13.3(–16) cm × (7.2–)9.6(–12.5) cm. Margins with numerous shallow serrations on both sides. Upper surface glabrous at maturity, glossy, some small hairs may be present near the base of the midrib. Lower surface usually with simple, uniseriate 5–10-celled hairs towards the base of the midrib and main laterals at maturity, hairs often dense near junction of the lamina and the petiolule. Central petiolule (1.3–)3.9(–6.6) cm long; lateral petiolule (0.7–)2.4(–4.5) cm long. Petiole (5–)8.5(–11.2) cm long, small rusty coloured hairs may be present, often glabrous at maturity, base swollen, lenticels

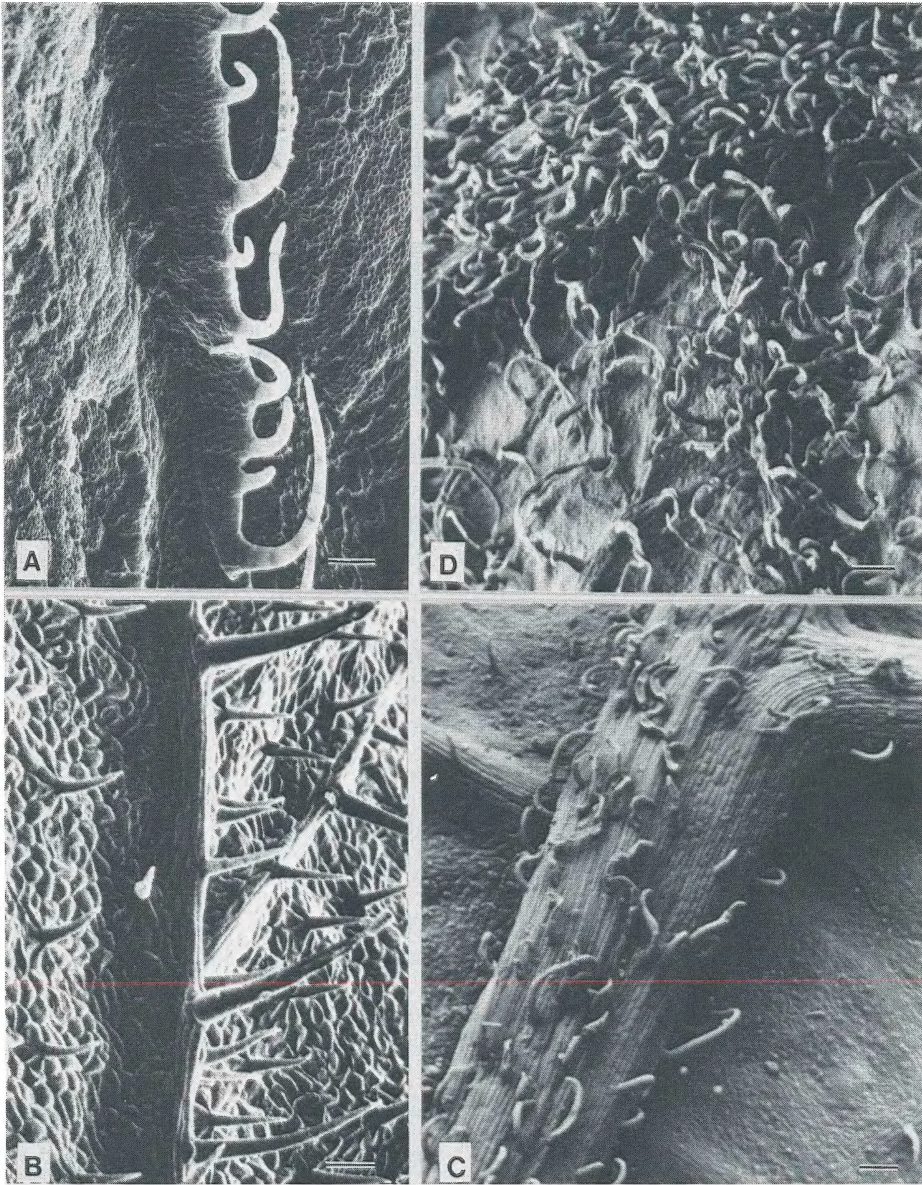


Fig. 2. A. *Cayratia maritima*, upper leaf surface showing the hooked hairs on the midrib. B. *C. trifolia*, upper leaf surface showing hairs scattered over surface of leaf as well as on the midrib. C. *C. acris*, distribution of hairs on the lower leaf surface. D. *C. cardiophylla*, distribution of hairs on the lower leaf surface. All scale bars equal 0.1 mm.

prominent. Stipules triangular 1–1.5 mm × 1 mm. Inflorescence axillary, 3–4 primary branches, cymose corymbiform 20 cm × 15 cm; peduncle 5–10 cm long. Calyx glabrous or with minute papillae. Corolla glabrous, 2–2.5 mm long, white. Filaments flattened, 1 mm long, anthers 1 mm long. Disc thick. Berry whitish at maturity drying to brown, depressed-globular, 1–1.5 cm × 1–1.2 cm. Seeds 1–4 per fruit, rounded, 5.5–7 mm × 5–7 mm, endosperm U-shaped, chalaza elongated. **Fig. 3A–D.**

Representative Specimens Examined. Queensland. COOK DISTRICT: Between Lockhart River airstrip and Mount Tozer, 12°04'S, 143°2'E, Feb 1980, *Clarkson* (BRI,JCT,K,QRS); Daintree River, on south bank about 5–6 miles [8–9.6 km] E of Daintree, Oct 1962, *Smith* 11507 (A,BRI,K,L); Mrs Kidner's Block, near Millstream River ca 10 km NNE of Ravenshoe, Apr 1979, *Lockyer* (BRI,CANB,CBG,QRS). NORTH KENNEDY DISTRICT: Near Tully River Bridge, Cardstone, 17°45'S, 145°40'E, Jan 1983, *Jackes & Jackes* (A,BISH,BRI,CANB,CBG,DNA,JCT,K,L,MEL NSW PERTH,QRS); Kirrama State Forest, NW Cardwell, Jun 1977, *Winsor* (JCT).

Specimens from 18 localities were examined.

Distribution and Habitat: This species is found (**Map 5.**) in rainforest or rainforest remnants from north of Cardwell 18°06'S, 146°02'E, to northern Cape York Peninsula.

Flowering period: spring to summer.

Fruiting period: summer to early autumn.

Notes and Observations: The specimen selected as the lectotype is the more complete specimen of the syntypes upon which Benthams based his description. *C. saponaria* (Seem. ex Benth.) Domin and *C. seemanniana* A.C.Smith have been confused in the literature as both species were based on the name *Vitis saponaria*. However as indicated by Smith (1942) these are two different species and the latter may be distinguished by 'the persistent tufts of hairs in the axils of nerves on the lower surface'. He also considered the leaflets to be thinner and the lateral leaflets to be more cordate at the base; however these are very variable characters.

The description of *Cissus bicolor* Domin does not agree with the specimen cited as the type. The leaves of this specimen (Domin 6373, 6374, PR) and of the illustration (Domin 1927, p923) are in fact the leaflets of *Cayratia saponaria*.

4. *Cayratia cardiophylla* B.R. Jackes, sp. nov. affinis *Cayratia acris* (F.Muell.) Domin filamentis staminalibus angustis, pilis 1–3 cellularibus ad junctioneum ovarii stylique, nerncon florens ante expansionem plenam foliorum in surculis novis, raro in sylvia pluvitali inventa distinguitur. **Typus:** Annan River, upstream growing at river edge over *Hibiscus*, 10 Dec 1978, *Duke* (holo: BRI; iso: CANB,NSW,PERTH, QRS,JCT).

Liana grandis plerumque decidua ramis teretibus tomentosis juventute; cortex rubescens squamata. Capreoli bifidi pubescentes. Folia trifoliolata; foliolus medius late ovato-circularis, apice acuminato-obtusius, basi cordatus 14.6 cm × 15.2 cm; folioli laterales obliqui 12.5 cm × 13.4 cm, marginibus in lateribus ambabus costae non profunde serratis, paginis ambis dense pubescentibus juventute, superiore sparse pubescenti maturitate pilis plerumque erectis simplicibus 5–7 cellularibus in pagina superiore et plerumque densis et saepe tortis 3–12 cellularibus in pagina inferiore, venis tertariis reticulum prominens facientibus; petiolulus medius (2.2–)3(–6) cm longus; petioluli laterales (1–)1.8(–4.5) cm longi; petiolus (7.5–)9.5(–13) cm longus, pubescens. Stipulae triangulares 1.5–2 mm longae pubescentes. Inflorescentia in surculo novo magnopere ultra folia juvenia expandentia, 2–3 ramis primariis, cymosa corymbiformis 9.5 cm × 9 cm, pedunculo 4–5 cm longo. Calyx cyathiformis margo membranaceo patulo, papillosus; corolla pallide viridis usque albescens extra papillosa, 2–2.5 mm longa; filamenta staminalia 1 mm longa, tantum parum complanata; antherae 0.6–0.75 mm longae; ovarium disco crasso circumcinctum labro parvo vel nullo, 1–3 cellularibus papillis ad junctionem ovarii et basis styli praeditum. Bacca viriditer alba usque alba, brunnea in sicco, depresso-globula 1–1.3 cm × 0.4–0.7 cm, 2–4 globatis seminibus continuens, endospermio U-formi in sectione transversali, praedito projectura media sed tum ea nunquam quam projecturae laterales longior.

Large sprawling vine with rounded stems, whitish tomentose when young, bark flakey, reddish. Tendrils bifid, pubescent. Plant usually deciduous. Leaves trifoliolate. Central leaflet broadly ovate-circular, apex acuminate-obtuse, base cordate (13–)14.6(–18) cm × (12–)15.2(–18.5) cm; lateral leaflets oblique (10.2–)12.5(–15) cm × (9.4–)13.4(–16.5) cm.

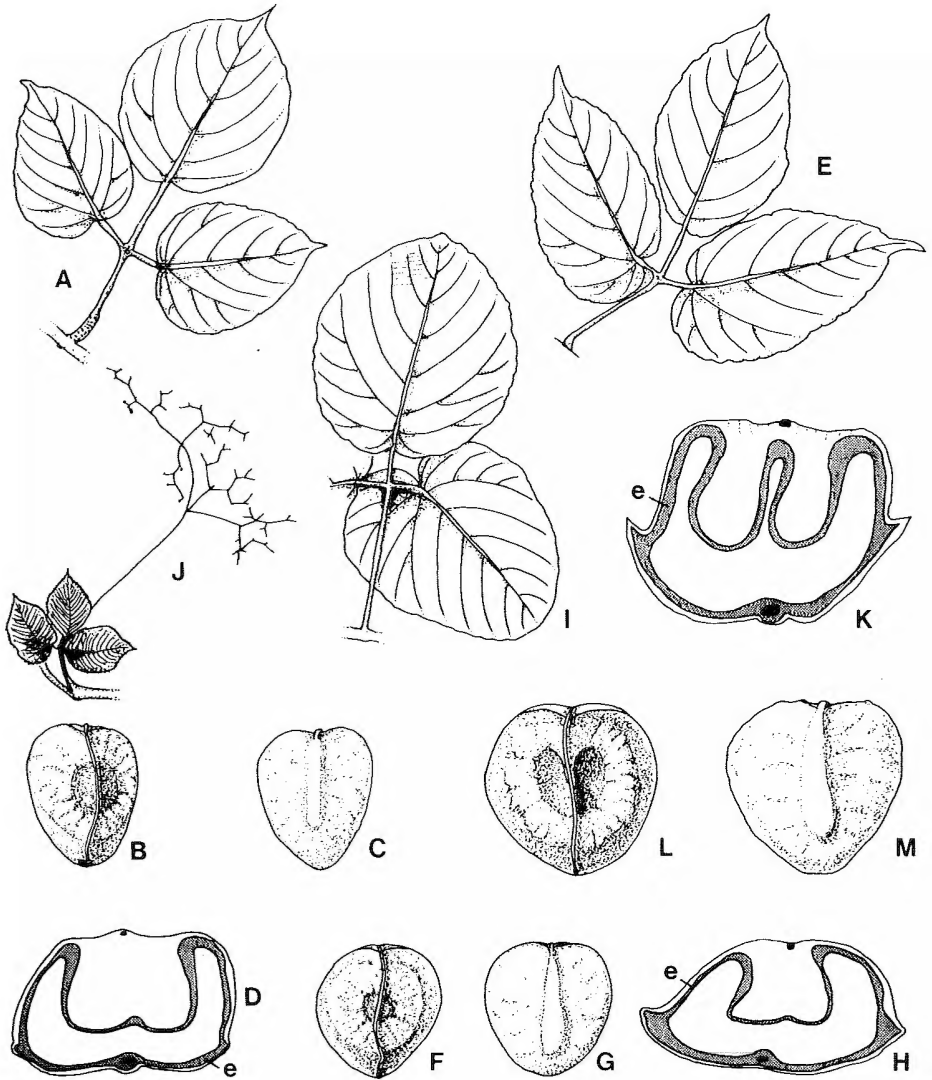


Fig. 3. *Cayratia saponaria*: A. leaf $\times 0.25$. B. seed, ventral surface showing position of the raphe and circular ridge formed by the underlying endotesta $\times 5$. C. seed, dorsal surface showing the position and shape of the perichalaza $\times 5$. D. median transverse section of mature seed $\times 10$. *C. acris*: E. leaf $\times 0.25$. F. seed, ventral surface showing position of the raphe and the circular ridge formed by the underlying endotesta $\times 5$. G. seed, dorsal surface showing the position and shape of the perichalaza $\times 5$. H. median transverse section of mature seed $\times 10$. *C. cardiophylla*: I. portion of trifoliolate leaf $\times 0.25$. J. inflorescence at anthesis showing very young leaves at base of peduncle $\times 0.5$. K. median transverse section of mature seed $\times 7.5$. L. seed, ventral surface showing position of the raphe and the circular ridge formed by the underlying endotesta $\times 5$. M. seed, dorsal surface showing the position and shape of the perichalaza $\times 5$. (e – lignified endotesta).

Margins with shallow serrations on both sides of the midrib. Both leaf surfaces densely pubescent when young, upper sparsely pubescent when mature, hairs usually erect, uniseriate 5–7-celled on the upper surface, on the lower surface hairs are 3–12-celled and usually dense and often twisted. Tertiary veins form a prominent network. Central petiolule (2.2–)3.8(–6) cm long; lateral petiolules (1–)1.8(–4.5) cm long. Petiole (7.5–)9.5(–13) cm long, pubescent. Stipules triangular 1.5–2 mm long, pubescent. Inflorescence axillary, borne on new growth and carried well beyond young expanding leaves, 2–3 primary branches, cymose corymbiform, (8–)9.5(–11) cm × (6–)9(–10) cm, peduncle 4–5 cm long. Calyx cupshaped with flaring membranous margin, papillose. Corolla papillose, pale green to whitish, 2–2.5 mm long. Filaments 1 mm long, only slightly flattened, anthers 0.6–0.75 mm long. Ovary surrounded by a thick disc, rim small or absent, 1–3-celled papillae present at the junction of the ovary and the base of the style. Berry greenish-white to white, drying brown, depressed-globular, 1–1.3 cm × 0.4–0.7 cm. Seeds 2–4 per fruit, rounded, 4–4.5 mm × 3–4 mm, endosperm in transverse section a modified U-shape, although the central projection is present, it is never longer than the lateral projections. **Figs. 2D, 3I–M.**

Representative Specimens Examined. **Queensland.** COOK DISTRICT: Sue Island, 10°12'S, 142°49'E, Oct 1981, *Clarkson* 3951 (BRI, QRS); Between Lockerbie and Somerset, 10°46'S, 142°33'E, Dec 1980, *Hyland* 10966 (QRS); Low Wooded Island, 15°05'S, 145°23'E, Sep 1973, *Stoddard* (BRI); Base of Black Mountain, SW of Cooktown, Dec 1965, *Rodd* 213 (NSW); Limestone outcrop 4 miles [6.4 km] N of Mungana, approx 17°05'S, 144°25'E, May 1970, *Webb & Tracey* (BRI).

Specimens from 39 localities were examined.

Distribution and Habitat: This vine, which is usually deciduous, is commonly found growing over beach rubble, along river edges and in semi-deciduous vine thickets, rarely in rainforest. It appears to prefer limestone based soils and coral rubble. It is found in North Queensland and the Torres Strait (**Map 3.**) chiefly on coral islands and around Chillagoe.

Flowering period: August to December.

Fruiting period: November to May.

Notes and Observations: Several sterile senescing specimens from Western Australia and Northern Territory have been provisionally placed in this species on the basis of leaf pubescence and shape, however further collections preferably obtained before the onset of the dry season are required for clarification. This species which is closely related to *C. acris* may be distinguished by a number of characters: the length/breadth ratio of the central leaflet is 0.96 ± 0.12 , compared with that for *C. acris* (1.47 ± 0.4); the filaments are much narrower; 1–3-celled hairs are present at the junction of the style and the top of the ovary, as well flowering occurs on new growth before the leaves have fully expanded. This species also appears to flower more frequently if the number of flowering specimens in collections is any indication. However sterile senescing specimens cannot be assigned absolutely to either species.

This species has been previously misidentified as *C. grandifolia*, however the type specimen of this species is less pubescent, although flowers in reasonable condition were unavailable, the leaves on the specimens were fully expanded.

5. *Cayratia acris* (F.Muell.) Domin in Fedde, Repert. 11: 294 (1912). **Syntypes:** Richmond R., *Beckler* (MEL, K); Burnett and Pine Rivers, *Mueller* (MEL, K).

Vitis acris F.Muell., *Fragm.* 11: 75 (1860); Benth., *Fl. Austral.* 1: 449 (1863); F.M.Bailey, *Qd Fl.* 1: 281 (1899); C. Moore, *Handb. Fl. N.S.W.*, 213 (1893).

Cissus acris (F.Muell.) Planchon in A. & C.DC., *Monogr. Phan.* 5: 576 (1887).

Cissus grandifolia Warburg, *Bot. Jahrb. Syst.* 18: 199 (1894). Type: Kelana, 6 Aug 1888, *Hellwig* 125 (K).

Cayratia grandifolia (Warb.) Merrill and Perry, *J. Arnold Arbor.* 22: 378 (1941).

Robust vine with rounded stems bearing uniseriate, spreading 4–15-celled hairs resulting in a whitish appearance when young. Tendrils bifid, usually pubescent. Plants occasionally deciduous. Leaves trifoliate. Central leaflet usually broadly lanceolate to ovate, apex acuminate to cuspidate, base rarely strongly cordate, (12.6–)16.2(–23.5) cm × (7–)11.3(–18.2) cm; lateral leaflets oblique (10.5–)14.6(–21.5) cm × (6.6–)10.4(–17) cm. Margins with

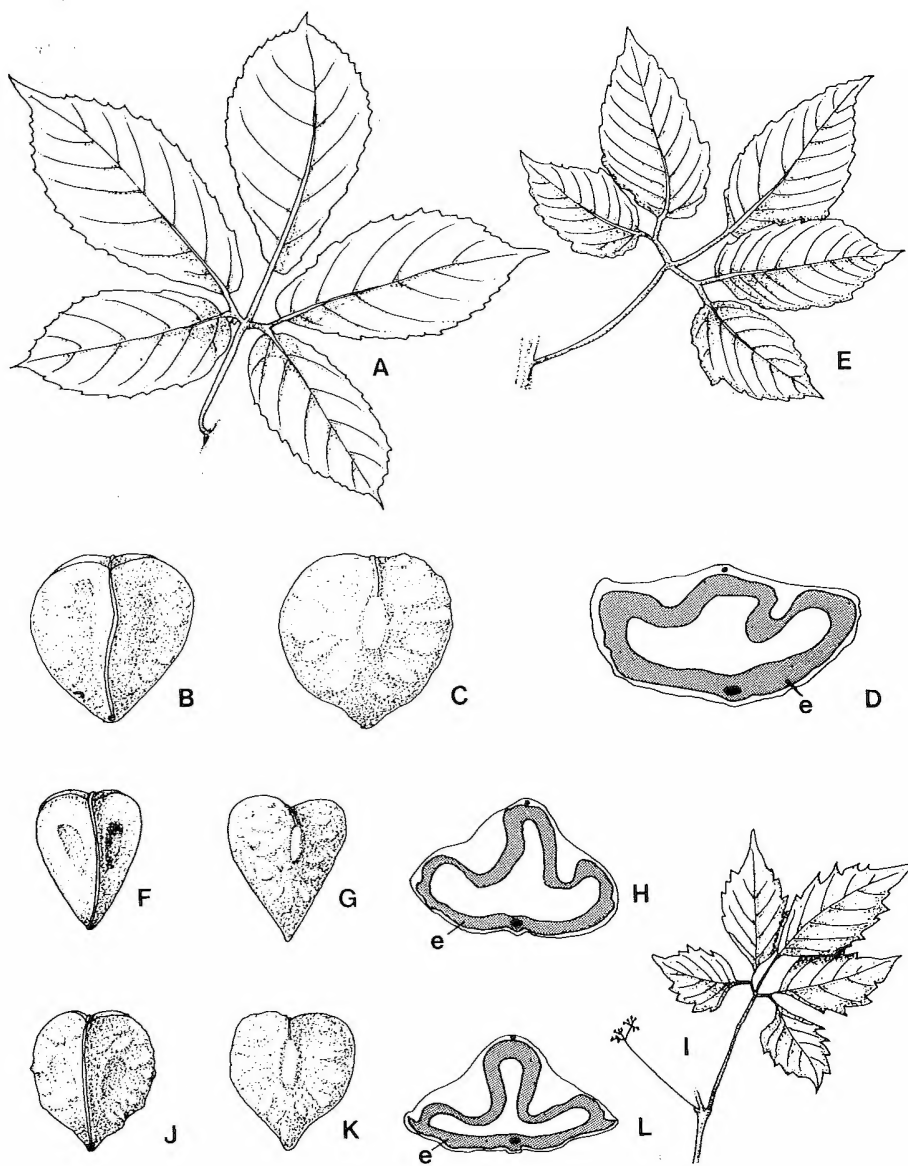


Fig. 4. *Cayratia eurynema*: A. leaf $\times 0.5$. B. seed, ventral surface showing the position of the raphe $\times 5$. C. seed, dorsal surface showing the shape and position of the perichalaza $\times 5$. D. median transverse section of mature seed $\times 7.5$. *C. japonica*: E. leaf $\times 0.5$. F. seed, ventral surface showing position of the raphe $\times 5$. G. seed, dorsal surface showing the position and shape of the perichalaza $\times 5$. H. median transverse section of mature seed $\times 10$. *C. clematidea*: I. leaf and leaf-opposed inflorescence $\times 0.5$. J. seed, ventral surface showing the position of the raphe $\times 5$. K. seed, dorsal surface showing the position and shape of the perichalaza $\times 5$. L. median transverse section of mature seed $\times 10$. (e - lignified endotesta).

numerous shallow serrations on each side of the midrib. Upper surface with uniseriate 4–10-celled hairs, at maturity these are usually associated with the raised veins, sparse elsewhere, lower surface usually densely pubescent, both costally and intercostally, hairs 4–10-celled, straight to curved. Central petiolule (2–)4.1(–5.9) cm long; lateral petiolules (0.7–)1.7(–3.5) cm long. Petiole (4.6–)8.3(–17.8) cm long, small hairs usually associated with the slightly swollen base, lenticels inconspicuous. Stipules triangular, glabrous, 1 mm long. Inflorescence axillary with 2–3 primary branches, cymose corymbiform, ca 25 cm × 20 cm; peduncle ca 10 cm long. Calyx spreading. Corolla often papillose, 1.5–2 mm × 1.5 mm, pale green to yellowish. Filaments 0.75 mm long, flattened, anthers 0.75 mm long. Disc thick, membranous rim extending well above the ovary. Berry creamy-white, drying brown, ovoid, 1 cm diameter. Seeds 1–4 per fruit, rounded, 5–6 mm × 4–5 mm, endosperm in transverse section U-shaped. Figs. 2C, 3E–H.

Representative Specimens Examined. Northern Territory. South of Bushman's Camp and north of Channel Point, north of Daly River, 13°15'S, 129°58'E, May 1978, *Webb & Tracey* 12215 (BRI,CANB). Queensland. COOK DISTRICT: Thursday Island, Feb 1984, *Garnett* (BRI,JCT); McIlwraith Range ca 14 miles [22.4 km] ENE of Coen, Oct 1962, *Smith* 11852 (BRI). NORTH KENNEDY DISTRICT: Cardstone, W of Tully, Jul 1979, *Jacks* (JCT). PORT CURTIS DISTRICT: Mount Etna via Rockhampton, May 1971, *Webb & Tracey* 10724 (BRI); Rosedale near Baffle Creek, Apr 1920, *White* (BRI). DARLING DOWNS DISTRICT: Cawdor, near Toowoomba, Jan 1976, *Gilbert* (BRI). New South Wales. NORTH COAST: Wilson Park, Lismore, Jan 1977, *Floyd* 195 (NSW); Byron Bay, Nov 1903, *Maiden & Boorman* (NSW).

Specimens from 57 Australian localities were examined.

Distribution and Habitat: Found from Northern New South Wales to the tip of Cape York, Queensland, (Map 4.) and into New Guinea as well as isolated localities in the Northern Territory. It is found chiefly in rainforest and to a lesser extent in semi-deciduous vine thickets and riverine gullies. This species appears to be deciduous under marginal conditions.

Flowering period: October–May.

Fruiting period: March.

Notes and Observations: This species occurs in New Guinea where it was described as *Cissus grandifolia* by Warburg (1894). Careful examination of Hellwig 125 (K) marked 'det. by Warburg' and Branderhorst 142 (K) cited by Lauterbach (1925) failed to separate this material from specimens of *C. acris*. Unfortunately the material is scrappy and as the majority of specimens of *C. acris* are vegetative, confusion has existed between this species and *C. cardiophylla* which has till now been misidentified as *C. grandifolia*. Merrill and Perry (1941) noted 'that the pubescence on the lower surface of the leaves is confined to the midrib and the larger nerves', whereas Warburg (1894) described the lower surface as pubescent.

6. *Cayratia euryinema* B.L.Burt, Bull. Misc. Inform.: 179 (1939). Type: Comboyne, N.S.W., May 1935, *E.C. Chisholm* (holo: K; iso: BRI, L,MO,NSW); para: Dorrigo, Jan 1936, *L. Frazer* (K).

Scrambling vine, stems angular, pubescent, hairs often reddish. Tendrils 3–5-fid, pubescent when young. Tuber absent, but extensive underground system present. Leaves pedate, 5 leaflets, soft. Central leaflet obovate-elliptical, apex acuminate-apiculate, oblique at base, (4.8–)8.6(–14) cm × (3–)4.2(–8) cm; lateral leaflets broad, oblique, upper lateral (5.2–)9.3(–13.5) cm × (3–)4.4(–7.2) cm; lower lateral (4–)6(–10) cm × (1.9–)3.1(–6) cm. Margins with numerous serrations on both sides of the midrib. Upper surface sparsely pubescent, hairs uniseriate 3–16-celled reddish, chiefly associated with the veins; hairs on lower surface similar but denser. Central petiolule channelled, (1.2–)2.2(–4.3) cm long; lateral petiolule (0.3–)0.8(–1.8) cm long. Petiole (4.2–)7.3(–12.5) cm long, ridged. Stipules triangular, 1.5–2 mm × 1 mm. Inflorescence axillary panicle corymbiform, 2–3 primary branches, 12.5–15 cm long, peduncle 4–8.5 cm long, pubescent. Calyx pubescent. Corolla papillose, 2–3.5 mm × 1–2 mm. Filaments 0.75 mm long, 0.5 mm broad, anthers 0.75 mm long, thecae diverge slightly at the base. Berry black, slightly compressed 8 mm × 6–8 mm. Seeds 1 rarely 2 per fruit, boat-shaped, 5 mm × 5 mm, 2 very shallow grooves present on ventral surface, endosperm in transverse section shallowly T-shaped. Fig. 4A–D.

Representative Specimens Examined. Queensland. MORETON DISTRICT: Blackall Range, Apr 1918, *White* (BRI); Mount Glorious, Moreton District, Jan 1945, *Clemens* (BRI,GH,K); New South Wales. NORTH COAST: Dorrigo Brush, Apr 1953, *Vickery* (NSW); Upper Williams River ca 7 miles [11.2 km] NNW of Salisbury, Aug 1960, *Johnson* (NSW). NORTHERN TABLELANDS: Gibraltar Range, 80 km NE of Glen Innes, Jun 1963, *Williams* (NE).

Specimens from 19 localities were examined.

Distribution and Habitat: This species is usually found on rainforest margins in an area extending from Barrington Tops N.S.W. (32°10'S, 151°30'E) to North of Brisbane (Map 5.). It has also been collected in the Blackall Ranges.

Flowering period: January to April.

Fruiting period: May.

Notes and Observations: This species is easily distinguished by the oblique base of the central leaflet, the reddish hairs on the soft leaves, the broad, thick staminal filament and the anther thecae which diverge slightly at the base.

7. *Cayratia japonica* (Thunb.) Gagnep. Notul. Syst. (Paris) 1: 349 (1911).

Vitis japonica Thunb., Fl. Japan 104 (1784); F.M.Bailey, Qd Fl. 1: 281 (1899). **Type:** not seen.

Cissus japonica Willd., Sp. Pl. 1: 659 (1797); DC., Prodr. 1: 632 (1824); Planchon in A. & C.DC., Monogr. Phan. 5: 561 (1887).

Columella japonica (Thunb.) Merrill, Philipp. J. Sci. 13: 145 (1918).

Vitis mollis Wall. Cat. No. 6025 (K).

Cissus obovata Lawson in J.D.Hook., Fl. Brit. India 1: 658 (1875).

Scrambling vine, stems ridged, often reddish when young, hairs chiefly at nodes. Tendrils 2–3-fid, ridged, usually glabrous. Tuber small or absent, plant rarely deciduous, extensive underground root system, which suckers readily. Leaves pedate with 5 leaflets. Central leaflet broadly-lanceolate to ovate, apex acuminate-cuspidate, base rounded, (5.2–)8.1(–11) cm × (2.6–)3.7(–5.7) cm; lateral leaflets oblique; upper laterals (2.9–)6.8(–11) cm × (1.9–)3.2(–4.8) cm; lower laterals (2.7–)4.8(–8) cm × (1.5–)2.7(–4.2) cm. Margins serrated sometimes sharply on both sides of the midrib. Upper surface pubescent, hairs uniseriate 5–7-celled, chiefly confined to the veins at maturity. Lower surface pubescent, hairs uniseriate 7–14-celled, longer ones usually associated with the veins. Sometimes densely pubescent often with a rusty tinge. Central petiolule ridged, (1.1–)2.1(–3.5) cm long; lateral petiolules ridged, (0.3–)0.9(–1.8) cm long. Petiole ridged, (2.6–)5.6(–9.2) cm long. Stipules triangular, 2–3(–5) mm × 1–1.5 mm. Inflorescence axillary, 3 primary branches, cymose corymbiform, (5–)8(–14) cm × (1–)3(–5) cm, peduncle (3–)6(–11) cm long. Calyx papillose, shortly lobed. Corolla papillose, 1.5–2 mm long, thickened on the back near the apex, greenish-white to yellowish. Filaments 0.5–0.75 mm long, anthers 0.5 mm long. Disc thick. Berry purplish-blue to black, depressed-globular 7–10 mm × 4–6 mm. Seeds 2–4 per fruit, trigonal, 3.5–5 mm × 3–4 mm; 2 shallow grooves on the ventral side, endosperm in transverse section T-shaped. **Figs. 4E–H.**

Representative Specimens Examined. Queensland, COOK DISTRICT: Iron Range, Jun 1948, *Brass* 19067 (A,CANB,K,L); Gap Creek, 38 km S by E of Cooktown, Sep 1960, *Smith* 11222 (BRI,L); Yarrabah, Jan 1910, *Domin* 6408 (PR). NORTH KENNEDY DISTRICT: 1 mile [1.6 km] E of Ravenshoe, Jun 1975, *Stocker* 1230 (QRS); Bluewater Forestry Reserve, N of Townsville, Sep 1978, *Jacks* (A,DNA,JCT,K,L,MEL). SOUTH KENNEDY DISTRICT: Dalrymple Heights, W of Mackay, Aug 1977, *Jacks* (BRI,JCT). BURNETT DISTRICT: Cania Gorge ca 37 km NW of Monto, Nov 1976, *Stanley* (BRI). WIDE BAY DISTRICT: Kin Kin, Sep 1919, *Francis* (BRI). MORETON DISTRICT: Mount Glorious in rainforest, May 1951, *Blake* 18756 (BRI).

Specimens from 58 Australian localities were examined.

Distribution and Habitat: This species is widespread in the Asian countries extending from Annam, north to Korea and east to New Caledonia. In Australia it is found along the east coast of Queensland (Map 6.) from just north of Brisbane to the tip of Cape York usually as a trailing or climbing vine 3–4 m high along rainforest margins. Soils various.

Flowering period: all months of the year.

Fruiting period: all months of the year.

Notes and Observations: This is a variable species, with some plants densely pubescent, whilst others are almost glabrous. Multibranched tendrils are sometimes found, and these have also been recorded for *C. eurynerma* and *C. clematidea*.



Maps 1-3. 1. *Cayratia maritima*. 2. *C. trifolia*. 3. *C. cardiophylla*.

8. *Cayratia clematidea* (F.Muell.) Domin in Fedde, Repert. 11: 264 (1912).

Vitis clematidea F.Muell., *Fragm.* 2: 74 (1860). **Lectotype** (designated here): Clarence River, *Beckler* (MEL 540138; islecto: K); **lectopara**: Brisbane R., *Mueller* (MEL,K,P); F.Muell., *Fragm.* 5: 210 (1866); F.Muell., *Fragm.* 6: 177 (1868); F.Muell., *Fragm.* 9: 126 (1875); Benth., *Fl. Austral.* 1: 449 (1863); F.M.Bailey, *Qd Fl.* 1: 282 (1899).

Cissus clematidea (F.Muell.) Planchon in A. & C.DC., *Monogr. Phan.* 5: 566 (1887).

Weakly scrambling, sometimes climbing vine, stems ridged, pubescent when young, hairs pale uniseriate 5–12-celled. Tendrils 2–3-fid, ridged, rarely pubescent. Tuber present, plant often deciduous. Leaves pedate with 5 leaflets, soft. Central leaflet broadly lanceolate-ovate, apex acuminate, base cuneate sometimes rounded, (2–)4.3(–8) cm × (1–)2.2(–4.2) cm; lateral leaflets oblique, upper laterals (1.8–)3.3(–6) cm × (1–)1.9(–3.4) cm; lower laterals (1.1–)2.5(–5.6) cm × (0.6–)1.6(–3) cm. Margins serrated on both sides of the midrib sometimes coarsely. Upper and lower surfaces with uniseriate 5–12-celled hairs, chiefly associated with the veins at maturity. Central petiolule ridged, (0.6–)1.5(–3) cm long; lateral petiolule ridged, (0.3–)0.5(–1) cm long. Petiole (1.5–)3.4(–9) cm long. Stipules narrow triangular, 3.5–5 mm × 1–1.5 mm. Inflorescence leaf-opposed or pseudoaxillary, usually 3 primary branches, cymose, corymbiform, (3–)6(–11) cm × (2–)5(–7) cm, peduncle (2–)4(–9) cm long, pubescent. Calyx short. Corolla papillose, 1.5–2 mm long, green to yellowish-green. Filaments 0.75 mm long, anthers 0.75 mm long. Disc entire, pink when fresh. Berry black, depressed globular, 6–7 mm × 4 mm. Seeds 1–4 per fruit, 3.5–4 mm × 3.5–4 mm, 2 very shallow grooves on the ventral side, endosperm in transverse section T-shaped. **Fig. 4I–L.**

Representative Specimens Examined. **Queensland.** NORTH KENNEDY DISTRICT: Paynes Lagoon, 100 km W of Townsville, Jun 1981, *Jacks* (BRI,JCT,QRS). SOUTH KENNEDY DISTRICT: Dalrymple Heights, Sep–Nov 1947, *Clemens* (K). LEICHHARDT DISTRICT: Blackdown Tableland, ca 35 km SE Blackwater, Sep 1971, *Henderson, Durrington & Sharpe* (BRI). MORETON DISTRICT: Montville, May 1943, *Blake* 14956 (BRI); Brisbane River, Mar 1933, *White* 8648 (A,BRI,K). **New South Wales.** NORTH COAST: Tweed District, Mar 1896, *Betche* (NSW); Seal Rocks, 20 miles [32 km] E of Buladelah, Aug 1965, *Briggs* (NSW); Williams River about 40 miles [64 km] N of Singleton, Jan 1963, *Pullen* 3753 (CANB). CENTRAL COAST: Prospect, May 1905, *Cabbage* (NSW); Shoalhaven River, Jan 1932, *Rodway* 685 (K,NSW). NORTHERN TABLELANDS: Mole River crossing, north of Silent Grove (SW of Tenterfield), Nov 1965, *Williams* (JCT,NE). NORTH WEST SLOPES: Cranky Rock, Warialda, Aug 1906, *Rupp* (NSW).

Specimens from 98 localities examined.

Distribution and Habitat: Usually found in moist shaded area, often on the edge of rainforest, climbing over rocks and shrubs. It extends from southern New South Wales to west of Townsville in north Queensland (**Map 7.**). Soils various.

Flowering period: Most of the year though predominately in summer.

Fruiting period: Most of the year though predominately in autumn.

Notes and Observations: This species is readily distinguished from *C. japonica* by the usually smaller leaves the margins of which are often sharply serrated, and the leaflet bases usually cuneate, the long narrow stipules, and the petals which are rarely thickened at the apex.

Acknowledgements

I would like to thank the Directors of all the Herbaria who have very kindly lent or allowed me access to their collections. I am indebted to Mr L. Pedley for preparing the Latin descriptions. The scanning electron micrographs were taken by Mrs H. Winsor. My husband's assistance is gratefully acknowledged.

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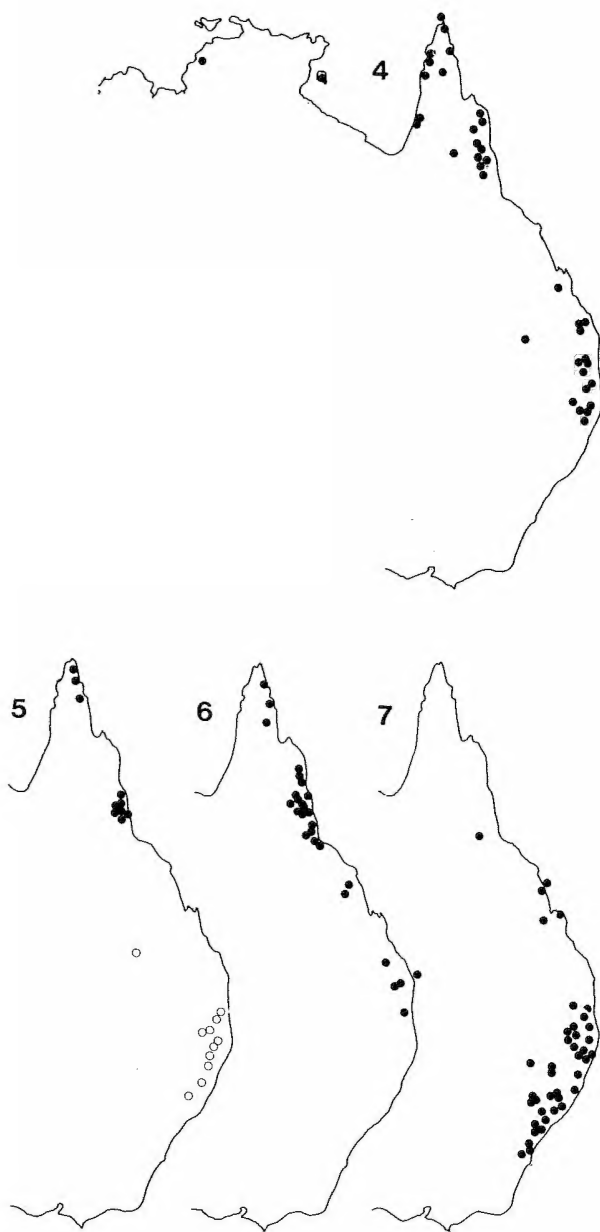
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Maps 4-7. 4. *Cayratia acris*. 5. ● *C. saponaria*, ○ *C. euryrema*. 6. *C. japonica*. 7. *C. clematidea*.

ANNOTATED CHECKLIST OF QUEENSLAND HEPATICAE

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Summary

A checklist is presented of all current binomials known from Queensland, together with synonyms relative to Queensland specimens or literature dealing specifically with such specimens. Footnotes are employed to expand on points of particular interest and a table of distributions is given, based on a proposal using four regional divisions. Genera in the checklist are numbered consecutively and are cross-referenced to an alphabetical index of genera. Notes on the history of hepatic research in Queensland and on the principal collections of Queensland specimens are also included.

History of hepatic research in Queensland

Throughout approximately 150 years of European settlement in Queensland, up to the 1970's, hepatic research has been confined to very limited collecting both in terms of the number of specimens obtained and the geographical area covered (Everist 1982). This work was undertaken by no more than a dozen people who, apart from one or two exceptions, were not directly involved with nor had any particular interest in hepatics as such. Only within the last decade has any comprehensive approach been attempted and as a result our understanding of the species present, their distributions, habitats, ecological peculiarities and affinities with overseas taxa is still very much in the formative stage.

The first positive mention of Queensland hepatics was made by F.M. Bailey soon after he became Colonial Botanist in 1881. Bailey was a man of almost unlimited energy and he found time to indulge an interest in the lower plants as well as carrying out his more formal work assignments. Most of his collecting was done in south-eastern Queensland but he made one trip to the northern Queensland rainforests of the Bellenden Ker Range area which resulted in a considerable number of new taxa being discovered. Other collectors of hepatics at this time include C.J. Wild, C.J. Gwyther, J. Shirley and J.H. Simmonds. Apart from listing the taxa found, Bailey did not systematically study the local hepatic flora. Most specimens were sent overseas for identification, the majority to Stephani in Leipzig, East Germany who retained any types and specimens of particular interest.

Since Bailey's work at the turn of the century virtually no interest was taken in hepatics for over 60 years. During 1963/64 Dr H.J. Hewson, Bureau of Fauna and Flora, Canberra, made extensive collections of *Aneura* and *Riccardia* in northern Queensland as a foundation for her revision of the family Aneuraceae in Australia and New Guinea (Hewson 1969, 1970). In the late 1970's a few visiting bryologists, realizing that Australia and in particular Queensland contained a vast storehouse of understudied material, did some minor collecting. However, most amounted to little more than one or two day recreational type excursions and largely covered the same ground as Bailey and his associates nearly a century before. It is only within the last six years that properly organized, extensive collecting has been undertaken. From 1980 onward I have systematically collected the area between Brisbane and Rockhampton and have lodged checklists with the Queensland Herbarium (BRI). I have studied habitat and ecological relationships in some environmentally significant areas and also reviewed and collated the collection of the Queensland Herbarium. Other notable collections have been made by Dr Marie L. Hicks of the Appalachian State University, in the rainforest belt between Tully and Daintree and Dr Barbara M. Thiers of New York Botanic Gardens in preparation for her pending review of the family Lejeuneaceae in Australia.

In spite of the limited amount of time and effort that has been expended on Queensland hepatics, a relatively comprehensive catalogue of taxa is now known, drawn mainly from the South and North Coast Regions (Map 1.). This paper aims to present such information as is currently available in the hope that it will help stimulate interest

in further collecting, particularly in the more neglected areas such as the Central Coast Region, Cape York Peninsula and the Gulf Country.

Collections of Queensland Hepaticae

The Queensland Herbarium collection numbers about 650 specimens of Australian hepatics, over half of which date from last century. Many of these are in poor condition and very few are suitable for serious taxonomic work. Approximately one third of the early collections are from interstate, having been supplied to Bailey for comparative purposes. Many were not clearly marked and it is often difficult to tell which are Queensland specimens. Hewson provided the Herbarium with some 80 specimens of *Aneura* and *Riccardia* following her collecting in the 1960's, among them several isotypes. The majority of the recent acquisitions were donated by me, and I also maintain an extensive personal collection of *Frullania* as well as representative specimens of other Queensland species.

Overseas herbaria which contain sizable collections of Queensland material include the Cryptogamic Herbarium, New York Botanic Gardens, New York, U.S.A. (NY), Appalachian State University, Boone, North Carolina, U.S.A. (BOON), and the Herbarium of the Hattori Botanical Laboratory, Nichinan-shi, Japan (NICH). Duplicates of many of my specimens have been sent to these institutions. The Conservatoire et Jardin Botaniques, Geneva, Switzerland (G) houses the many type specimens of endemic Queensland species which were included in the Stephani Collection.

Total geographical area covered

The total area covered comprises the political entity of the State of Queensland which includes the Torres Strait Islands, the various islands and cays of the Great Barrier Reef, the offshore islands of the southern coast such as Curtis, Fraser, Moreton, Stradbroke, etc., as well as the islands in the Gulf of Carpentaria east of the longitude of the Queensland/Northern Territory border (**Map 1.**).

Regional divisions

For the purposes of depicting distribution patterns, the overall area is divided into four regions based on physical and climatic characteristics (**Map 1.**). In line with the Bureau of Meteorology (1977) regional classification based on rainfall, the initial division corresponds to the easternmost watershed created by the Great Dividing Range and forms the boundary between the Coastal and Inland sections. Preliminary studies show that to the east of this line, the hepatic population is primarily dominated by moisture loving taxa of the Order Jungermanniales, while to the west there is a limited range of species drawn from what are generally regarded as the xeromorphic genera (*Targionia*, *Riccia*, etc.) of the Order Marchantiales. The Coastal section is further subdivided into three regions, the South Coast, Central Coast and North Coast. The boundaries between these regions are in the vicinity of Rockhampton and Ayr and again correspond to those of the meteorological districts. There does not seem to be any justification in further sub-dividing the Inland section.

The wetter areas supporting the most diversified and prolific hepatic flora tend to occur towards the centre of each coastal region, while the boundary areas equate closely with belts of lower rainfall. As a result the number and range of taxa in the vicinity of the boundaries is small, thus suggesting the concept of natural hepatic regions corresponding to the regional divisions of the State proposed here.

Arrangement of the checklist

The classification employed in the arrangement of the checklist is that of Schuster (1979). The primary reasons for choosing this system are:

- a. It is based on widely accepted, modern views regarding the evolution of the Hepaticae.
- b. Detailed descriptions of the taxa are in readily available publications.
- c. It lends itself to herbarium use in that it is compatible with other systems already established in various overseas herbaria.

In this system Schuster set down seven Orders within the Hepaticae. Of these only three have been reported from Queensland: Jungermanniales, Metzgeriales and Marchantiales. The checklist is divided into sections corresponding to these Orders and is then further subdivided according to Schuster's arrangement for families and genera. The names of the Orders are in **BOLD CAPITALS** and the names of families and genera are in **bold Upper and lower case**. Species and any subspecific taxa are subsequently arranged alphabetically.

Taxa reported in recognized literature or known to exist as specimens are considered legitimate. Synonyms relative to Queensland specimens or names under which these specimens have been recorded are given in *italics* immediately beneath the current name. Specimen references are given for all taxa cited as sp.

All genera in the checklist are numbered consecutively with the numbers cross-referencing to the alphabetical index of genera following the checklist.

Abbreviations used in the checklist

STH(S)	South Coast Region	} Species reliably reported to occur in that region.
CNT(C)	Central Coast Region	
NTH(N)	North Coast Region	
INL(I)	Inland Region	
?	Report of species in that particular region is either not considered reliable or the locality is not positively known and its occurrence in that region is presently tentative.	
‡	Little is known about the reported occurrence of this species in Queensland and its inclusion should be treated cautiously pending further investigation.	
1.2.3.	Cross-reference numbering, for genera.	
(1) (2)	Footnote numbering.	

Reliability of information

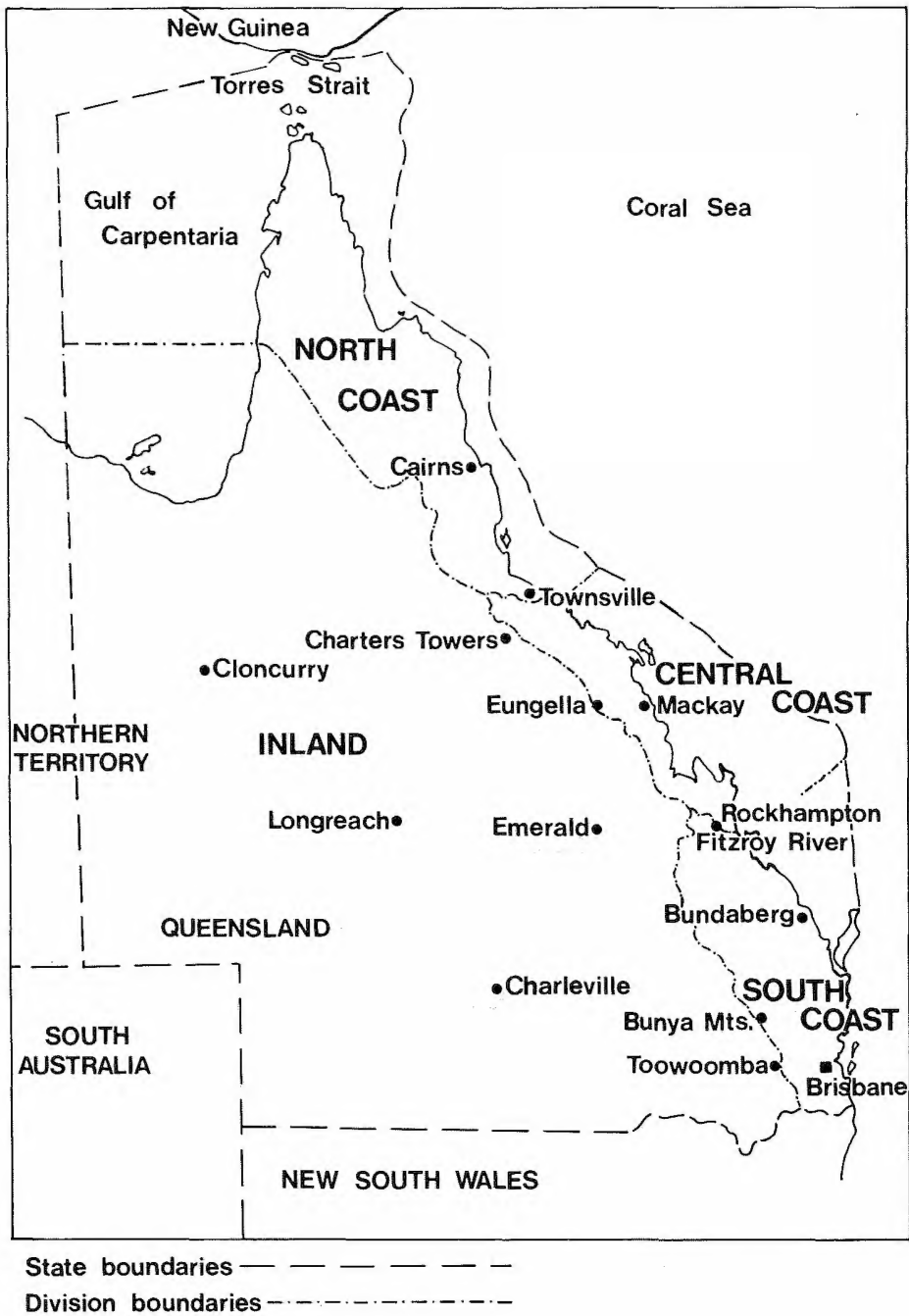
As many reports of Queensland hepatics date back almost a hundred years and are often contained in obscure and difficult to obtain literature, not all have been personally investigated. In some cases it has been necessary to resort to second-hand information but every attempt has been made to ascertain the reliability of all data used. Only comprehensive revisions of families and genera involving detailed comparative studies with overseas specimens can resolve the many taxonomic and nomenclatural problems which remain. A list of the literature used in compiling the checklist is given in Appendix A.

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Map 1. Queensland showing proposed regional hepatic divisions.

CHECKLIST AND DISTRIBUTION OF TAXA

Botanical Name	Region			
	STH	CNT	NTH	INL NOTES
JUNGERMANNIALES				
Trichocoleaceae				
1. Trichocolea Dumort.				
T. pluma (Reinw., Blume & Nees) Mont.			N	
<i>Jungermannia pluma</i> Reinw., Blume & Nees				
Lepidoziaceae				
2. Lepidozia (Dumort.) Dumort.				
L. eeni S. Arnell			N	‡
L. laevifolia (J.D.Hook. & Tayl.) Tayl.	S		N	
<i>Jungermannia laevifolia</i> J.D.Hook. & Tayl.				
L. procera Mitt.			N	
L. sp. (Windolf 739,1136)	S			
3. Kurzia von Martens				
K. calcarata (Steph.) Grolle	S			‡
<i>Lepidozia calcarata</i> Steph.				
K. compacta (Steph.) Grolle	S			
<i>Lepidozia compacta</i> Steph.				
K. hippurioides (J.D.Hook. & Tayl.) Grolle	S			
<i>Jungermannia hippurioides</i> J.D.Hook. & Tayl.				
<i>Lepidozia capillaris</i> (Sw.) Lindenb.				
K. lateconica (Steph.) Grolle			N	‡
<i>Lepidozia lateconica</i> Steph.				
<i>Microlepidozia lateconica</i> (Steph.) Fulf. & J.Tayl.				
K. reversa (Carr. & Pears.) Grolle	S			
<i>Lepidozia reversa</i> Carr. & Pears.				
<i>Psiloclada reversa</i> (Carr. & Pears.) Schiffn.				
4. Telaranea Spr. ex Schiffn.				
T. capilligera (Schwaegr.) Schust.	S			‡ (1)
<i>Jungermannia capilligera</i> Schwaegr.				
<i>Lepidozia capilligera</i> (Schwaegr.) Lindenb.				
T. centipes (Tayl.ex Gott., Lindenb. & Nees) Schust.	S			
<i>Lepidozia centipes</i> Tayl. ex Gott., Lindenb. & Nees				
T. dispar (Mont.) Hodgs.	S			
<i>Lepidozia dispar</i> Mont.				

(1) Possibly conspecific with *Telaranea dispar* (Scott 1985).

T. tetradactyla (J.D.Hook & Tayl.) Hodgs.	N	‡	(2)
<i>Jungermannia tetradactyla</i> J.D.Hook. & Tayl.			
5. Bazzania S.F.Gray			
B. accreta (Lehm. & Lindenb.) Trev.	N		(3)
<i>Mastigobryum accretum</i> Lehm. & Lindenb.			
B. adnexa (Lehm. & Lindenb.) Trev.	S	C	N (4)
<i>Jungermannia adnexa</i> Lehm. & Lindenb.			
<i>Mastigobryum novae-hollandiae</i> Lindenb. & Gott. ex Nees			
B. baileyana (Steph.) Steph. ex Rodw.	S		
<i>Mastigobryum baileyana</i> Steph.			
B. filiformis Steph.		N	‡
<i>Mastigobryum filiforme</i> (Steph.) Steph.			
B. involuta (Mont.) Trev.	S	C	N (5)
<i>Herpetium involutum</i> Mont.			
B. mittenii (Steph.) Steph.	S		N ‡
<i>Mastigobryum mittenii</i> Steph.			
B. novae-zelandiae (Mitt.) Besch. & Massal.		N	‡
<i>Mastigobryum novae-zelandiae</i> Mitt.			
6. Acromastigum Evs.			
A. colensoanum (Mitt.) Evs. ex Reim.		N	
<i>Mastigobryum colensoanum</i> Mitt.			
7. Zoopsis (J.D.Hook. & Tayl.) J.D.Hook.			
Z. argentea (J.D.Hook. & Tayl.) J.D.Hook.	S	C	N
<i>Jungermannia argentea</i> J.D.Hook. & Tayl.			
<i>Cephalozia argentea</i> (J.D.Hook & Tayl.) Lindenb.			
Z. setulosa Leit.	S		N
<i>Cephalozia setulosa</i> (Leit.) Spr.			
8. Hyalolepidozia S.Arnell			
H. sp. aff. H. longiscypha (Tayl.) Grolle (Windolf 569,570)	S		

Cephaloziellaceae

9. Cephaloziella (Spr.) Schiffn.

C. arctica Bryhn & Douin	S		
C. exiliflora (Tayl.) Douin	S		
<i>Jungermannia exiliflora</i> Tayl.			
C. hirta (Steph.) Schust.	S		
<i>Cephalozia hirta</i> Steph.			

(2) Possibly a misidentification for *Telaranea dispar* but because of its great geographical separation from other confirmed occurrences of that species, it has been retained here.

(3,4,5) All three species are possibly conspecific according to Scott (1985) but considering the poor understanding of the genus in Australia, all names under which Queensland specimens have been recorded have been listed here.

Jackiellaceae**10. Jackiella** Schiffn.

J. javanica Schiffn. N

Jungermanniaceae**11. Chandonanthus** Mitt.

C. hirtellus (Web.) Mitt. N

Jungermannia hirtella Web.

12. Anastrophyllum (Spr.) Steph.

A. piligerum (Reinw., Blume & Nees) Steph. N

Jungermannia piligera Reinw., Blume & Nees

13. Andrewsianthus Schust.

A. puniceus (Nees) Schust. N ‡

Jungermannia punicea Nees

14. Cuspidatula Steph.

C. monodon (Tayl. ex Lehm.) Steph. N

Jungermannia monodon Tayl. ex Lehm.

15. Jungermannia L.

J. hasskarliana (Nees) Steph. N

Alicularia hasskarliana Nees

J. orbiculata (Col.) Grolle N ‡

Gymnomitrium orbiculatum Col.

Nardia fragilis Steph. ex Bailey

J. wattsiana Steph. S N

Jungermannia karsteniana Beauv.

Jungermannia montana (Steph.) Steph.

Nardia montana Steph.

Plectocolea eenii S.Arnell

Solenostoma australe Steph.

16. Notoscyphus Mitt.

N. lutescens Schiffn. N

Geocalycaceae**17. Lophocolea** (Dumort.) Dumort.

L. biciliata (J.D.Hook. & Tayl.) Mitt. S

Jungermannia biciliata J.D.Hook. & Tayl.

L. semiteres (Lehm. & Lindenb.) Mitt. S C

Jungermannia semiteres (Lehm. & Lindenb.) Mitt.

Lophocolea heterophylloides Nees

18. Chiloscaphus Corda

C. argutus (Reinw., Blume & Nees) Nees S C N

Jungermannia arguta Reinw., Blume & Nees

var. *spathulifolius* Steph. S ‡

C. communis Steph.		N	‡
C. fissistipus (J.D.Hook. & Tayl.) Tayl.	S		
<i>Jungermannia fissistipa</i> J.D.Hook. & Tayl.			
C. triacanthus (J.D.Hook. & Tayl.) Steph.	S		
<i>Lophocolea triacantha</i> J.D.Hook. & Tayl.			
Plagiochilaceae			(6)
19. Plagiochila (Dumort.) Dumort.			
P. abietina (Nees) Lindenb.		N	
<i>Jungermannia abietina</i> Nees			
P. acutifolia Steph.		N	
P. arbuscula (Bridel ex Lehm. & Lindenb.) Lindenb.		N	
<i>Jungermannia arbuscula</i> Bridel ex Lehm. & Lindenb.			
P. baileyana Steph.		N	
<i>P. conturbata</i> Steph.			
P. bantamensis (Reinw., Blume & Nees) Lindenb.		N	
<i>Jungermannia bantamensis</i> Reinw., Blume & Nees			
P. blepharophora (Nees) Nees		N	
<i>Jungermannia blepharophora</i> Nees			
P. dendroides (Nees)Lindenb.		N	
<i>Jungermannia dendroides</i> Nees			
P. fasciculata Lindenb.	S	N	
P. fruticella (J.D.Hook. & Tayl.) J.D.Hook. & Tayl.	S		‡
<i>Jungermannia fruticella</i> J.D.Hook. & Tayl.			
<i>P. dicksonii</i> J.D.Hook. & Tayl.			
P. furcata Steph.		N	
P. hicksii Inoue		N	
P. lyallii Mitt.	S		‡
P. mittenii Steph.		N	‡
P. obscura Col.		N	
P. obtusa Lindenb.		N	
P. pleurata (Tayl.) J.D.Hook. & Tayl.	S		
<i>Jungermannia pleurata</i> Tayl.			
P. pseudobtusa Inoue		N	
P. queenslandica Steph.	S	N	
<i>P. bellenderiensis</i> Steph.			
<i>P. multifurcata</i> Steph.			
<i>P. teysmannii</i> Sande Lac.			
P. renitens (Nees) Nees		N	
<i>Jungermannia renitens</i> Nees			

(6) The situation regarding several species of *Plagiochila* needs clarification but a thorough revision dealing specifically with Queensland specimens would be required. The status of some species and their synonymy as listed here may ultimately be modified.

<i>P. semidilatata</i> Inoue		N	
<i>P. sydneyensis</i> Beauv.		N	
<i>P. trapezoidea</i> Lindenb.		N	
<i>P. vitiensis</i> Mitt.		N	
<i>P. brotheri</i> Steph.			
<i>P. wattsii</i> Steph. ex Rodw.	S		
20. Plagiochilium Hatt.			
<i>P. oppositus</i> (Reinw., Blume & Nees) Hatt.		N	
<i>Jungermannia opposita</i> Reinw., Blume & Nees			
Acrobolbaceae			
21. Lethocolea Mitt.			
<i>L. squamata</i> (Tayl.) Hodgs.	S		(7)
<i>Podanthe squamata</i> Tayl.			
<i>Noteroclada confluens</i> auct. non J.D.Hook. & Tayl.;			
Windolf (BRI).			
22. Goebelobryum Grolle			
<i>G. unguiculatum</i> (J.D.Hook. & Tayl.) Grolle	S	N	
<i>Jungermannia unguiculata</i> J.D.Hook. & Tayl.			
<i>Goebelobryum grossitextum</i> (Steph.) Grolle			
<i>Gymnanthe unguiculata</i> (J.D.Hook. & Tayl.) Mitt.			
Schistochilaceae (8)			
23. Schistochila Dumort.			
<i>S. baileyana</i> Steph.		N	‡
<i>S. brotheri</i> Steph.		N	‡
<i>S. cristata</i> Steph.		N	
Balantiopsidaceae			
24. Balantiopsis Mitt.			
<i>B. diplophylla</i> (J.D.Hook. & Tayl.) Mitt.		N	
<i>Jungermannia diplophylla</i> J.D.Hook. & Tayl.			
<i>B. brotheri</i> Steph.			
Pleuroziaceae			
25. Pleurozia Dumort.			
<i>P. articulata</i> (Lindenb.) Schiffn.		N	
<i>Physiotium articulatum</i> Lindenb.			
<i>P. muelleri</i> Steph.		N	
<i>Physiotium muelleri</i> Gott.			

(7) Grolle (pers. comm.) asserts that *Noteroclada* does not occur in Australasia and so the numerous reports of this species over the years are obviously misidentifications. Subsequent examination of numerous Queensland specimens dating back to 1885, show that most, if not all, are in fact *Lethocolea squamata*.

(8) Practically nothing is known regarding Queensland species of *Schistochila*. Schuster and Engel's revision of *Schistochila* should help clarify most points when it is completed. All known binomials have been listed.

Radulaceae**26. Radula** Dumort.

<i>R. acutiloba</i> Steph.	S		N	
<i>R. buccinifera</i> (J.D.Hook. & Tayl.) Tayl.	S	C	N	
<i>Jungermannia buccinifera</i> J.D.Hook. & Tayl.				
<i>R. mittenii</i> Steph.				
<i>R. hicksiae</i> Yamada			N	
<i>R. javanica</i> Gott.			N	
<i>R. gottscheana</i> Tayl.				
<i>R. jovetiana</i> Yamada			N	
<i>R. kurzii</i> Steph.			N	
<i>R. multiflora</i> Gott. ex Schiffn.			N	
<i>R. novae-hollandiae</i> Hampe	S		N	
<i>R. ocellata</i> Yamada			N	
<i>R. patens</i> Yamada			N	
<i>R. reflexa</i> Nees & Mont.			N	
<i>R. retroflexa</i> Tayl.			N	
var. <i>fauciloba</i> (Steph.) Yamada	S		N	
<i>R. fauciloba</i> Steph.				
<i>R. ventricosa</i> Steph.			N	‡

Mastigophoraceae**27. Mastigophora** Nees

<i>M. diclados</i> (Bridel ex Web.) Nees			N	
<i>Jungermannia diclados</i> Bridel ex Web.				

Lepidolaenaceae**28. Lepidolaena** Dumort.

<i>L. sp. aff. L. taylorii</i> (Gott.) Trev.			N	(9)
<i>Polyotus taylorii</i> (Gott.) Trev.				
<i>Polyotus sp. aff. P. taylorii</i> (Gott.) Trev.				
(F.M.Bailey BRI 332127)				

Porellaceae**29. Porella** L.

<i>P. cranfordii</i> (Steph.) Hatt.	S		N	
<i>Madotheca cranfordii</i> Steph.				
<i>P. queenslandica</i> (Steph.) Hatt.	S			
<i>Madotheca stangeri</i> Steph.				

(9) Based on a single specimen collected last century by F.M. Bailey and now held in the Queensland Herbarium. It is minute and in very poor condition but appears to be as determined, apparently by Stephani. In addition Hattori (1979b) notes that the type of *Frullania fissistipula* Steph. (from Bellender Ker, North Queensland) is in fact a species of *Lepidoleana* but he gives no further details.

Jubulaceae**30. Frullania Raddi**

<i>F. allanii</i> Hodgs.	S		
<i>F. apiculata</i> (Reinw., Blume & Nees) Dum. var. <i>parva</i> Hatt.			N
<i>F. australis</i> Steph.	S		N
<i>F. baileyana</i> Steph.	S		(10)
<i>F. cataractarum</i> Steph.	S		
<i>F. crassitexta</i> Steph.	S		
<i>F. dietrichiana</i> Steph.	S		
<i>F. difficilis</i> Steph.	S		
<i>F. ericoides</i> (Nees) Mont.	S		N
<i>Jungermannia ericoides</i> Nees			
<i>F. squarrosa</i> (Reinw., Blume & Nees) Nees			
<i>F. exigua</i> Steph.	S		‡ (11)
<i>F. falciloba</i> Tayl. ex Lehm.	S	C	
<i>F. forsythiana</i> Steph.			
<i>F. ferdinandi-muelleri</i> Steph.	S		
<i>F. flexuosa</i> Hatt.		C	
<i>F. fugax</i> (J.D.Hook. & Tayl.) Tayl.	S		‡ (12)
<i>Jungermannia fugax</i> J.D.Hook. & Tayl.			
<i>F. hicksiae</i> Hatt.			N
<i>F. johnsonii</i> Steph.			N
<i>F. hasskarliana</i> Lindenb. subsp. <i>queenslandica</i> Hatt.			
<i>F. monocera</i> (J.D.Hook. & Tayl.) Tayl.	S		N
<i>Jungermannia monocera</i> J.D.Hook. & Tayl.			
var. <i>depauperata</i> Hatt.	S		
<i>F. hampeana</i> Nees			
<i>F. neosheana</i> Hatt.			N
<i>F. nodulosa</i> (Reinw., Blume & Nees) Nees			N
<i>Jungermannia nodulosa</i> Reinw., Blume & Nees			
var. <i>plana</i> Schiffn.			N ‡
<i>F. pentapleura</i> Tayl.	S		
<i>F. probosciphora</i> Tayl.	S		‡ (13)
<i>F. reptans</i> Mitt.			

(10) Possibly conspecific with *Frullania yorkiana* (Hattori 1979b, 1984).

(11) *Frullania exigua* is almost certain to be a misidentification but as no specimen has ever been found which equates with the report made by Bailey in 1890 it is impossible to say what the species in fact was.

(12) Bailey's record of *Frullania fugax* in Queensland (1888) seems to be based on a specimen that is very similar to the one that was later (1910) described by Stephani as *Frullania baileyana* but the point needs further study.

(13) The status of *Frullania probosciphora*–*F. reptans* synonymy and the occurrence of the species in Queensland is uncertain.

F. queenslandica Steph.	S			
F. rostrata (J.D.Hook. & Tayl.) J.D.Hook. & Tayl. <i>Jungermannia rostrata</i> J.D.Hook. & Tayl.	S		N	
F. rubella Gott. ex Steph. <i>F. filipendra</i> Steph. var. elongata (Steph.) Hatt. <i>F. elongata</i> Steph.	S	C		I
F. seriata Gott. ex Steph.	S			
F. serrata Gott.			N	
F. sheana Hatt.			N	
F. simmondsii Steph.	S			
F. spinifera Tayl.	S			‡
F. squarrosula (J.D.Hook. & Tayl.) Tayl. <i>Jungermannia squarrosula</i> J.D.Hook. & Tayl.	S	C		
F. subhampeana Hodgs.	S		N	
F. subtropica Steph.	S	C		
F. ternatensis Gott. var. non-appendiculata Hatt.			N	
F. wildii Steph.	S			
F. yorkiana Steph.			N	
F. sp. aff. F. pentapleura Tayl. (Windolf 681,682,910, 941,960)	S			(14)
F. sp. 1. (Windolf 243,250,252)	S			
F. sp. 2. (Windolf 700,701,702)	S			
Lejeuneaceae				(15)
31. Brachiolejeunea (Spr.) Steph.				
B. eavesiana (Gott. & Muell.) Steph. <i>Phragmicoma eavesiana</i> Gott. & Muell.			N	‡
B. thozetiana (Gott. & Muell.) Steph. <i>Phragmicoma thozetiana</i> Gott. & Muell.	S		N	‡ (16)
32. Caudalejeunea Steph.				
C. reniloba (Gott.) Steph. <i>Phragmicoma reniloba</i> Gott.			N	
33. Mastigolejeunea (Spr.) Steph.				
M. humilis (Gott.) Steph. <i>Phragmicoma humilis</i> Gott.			N	
M. integrifolius Steph.			N	

(14) Several undescribed species of *Frullania* appear to exist in southern Queensland but so far no fertile material has been collected.

(15) Australian Lejeuneaceae is currently being revised by Dr. Barbara Thiers and this list should be used only as an interim measure.

(16) Possibly conspecific with *Spruceanthus semirepandus* (Thiers pers. comm.).

M. ligulata (Lehm. & Lindenb.) Schiffn.			N	
<i>Phragmicoma ligulata</i> Lehm. & Lindenb.				
M. phaea Gott. ex Steph.	S		N	
34. Lopholejeunea (Spr.) Schiffn.				
L. australis Steph.	S			
L. eulopha (Tayl.) Steph.	S		N	
<i>Lejeunea eulopha</i> Tayl.				
<i>Lopholejeunea fimbriata</i> (Gott.) Schiffn.				
L. hispidissima Steph.	S			
L. loheri Steph.			N	
L. nigricans (Lindenb.) Schiffn.			N	
<i>Lejeunea nigricans</i> Lindenb.				
L. plicatiscypha (J.D.Hook. & Tayl.) Steph.			N	‡
<i>Phragmicoma plicatiscypha</i> J.D.Hook. & Tayl.				
L. subfusca (Nees) Schiffn.	S		N	
<i>Jungermannia subfusca</i> Nees				
35. Acrolejeunea (Spr.) Steph.				
A. arcuata (Nees) Grolle & Grad.			N	
<i>Jungermannia arcuata</i> Nees				
A. aulacophora (Mont.) Steph.	S	C	N	
<i>Phragmicoma aulacophora</i> Mont.				
A. pycnoclada (Tayl.) Schiffn.	S		N	
<i>Ptychanthus pycnoclada</i> Tayl.				
A. securifolia (Nees) Watts ex Steph.	S			
<i>Jungermannia securifolia</i> Nees				
<i>A. wildii</i> Steph.				
<i>Ptychocoleus parvus</i> Steph.				
36. Schiffneriolejeunea Verd.				
S. cumingiana (Mont.) Grad.			N	‡
<i>Phragmicoma cumingiana</i> Mont.				
<i>Ptychocoleus cumingianus</i> Steph.				
<i>Ptychocoleus novae-guineae</i> (Steph.) Steph.				
<i>Acrolejeunea novae-guineae</i> Steph.				
S. tumida (Nees) Grad. var. haskarliana (Gott.) Grad.	S	C	N	
<i>Phragmicoma haskarliana</i> Gott.				
<i>S. haskarliana</i> (Gott.) Grad.				
37. Archilejeunea (Spr.) Schiffn.				
A. mariana (Gott.) Steph.			N	
<i>Lejeunea mariana</i> Gott.				
A. olivacea (J.D.Hook. & Tayl.) Steph.	S		N	
<i>Jungermannia olivacea</i> J.D.Hook. & Tayl.				
<i>A. scutellata</i> (Tayl.) Steph.				

38. Thysananthus Lindenb.

T. convolutus Lindenb.		N	
T. fruticosus (Lindenb. & Gott.) Steph.		N	‡
<i>Bryopteris fruticosa</i> Lindenb. & Gott.			
T. planus Sande Lac.	S	N	
T. spathulistipus (Reinw., Blume & Nees) Lindenb.	S	N	
<i>Jungermannia spathulistipa</i> Reinw., Blume & Nees			

39. Spruceanthus Verd.

S. polymorphus (Sande Lac.) Verd.		N	
<i>Lejeunea polymorpha</i> Sande Lac.			
S. semirepandus (Nees) Verd.	S	N	‡
<i>Jungermannia semirepanda</i> Nees			

40. Stictolejeunea (Spr.) Schiffn.

S. richardii Verd.		N	
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41. Ptychanthus Nees

P. stephensonianus (Mitt.) Steph.		N	‡
<i>Lejeunea stephensonianus</i> Mitt.			
<i>Ptycholejeunea stephensonianus</i> Mitt.			
P. striatus (Lehm. & Lindenb.) Nees		N	
<i>Jungermannia striata</i> Lehm. & Lindenb.			
P. squarrosus Mont. ex Lehm.		N	‡

42. Ceratolejeunea (Spr.) Schiffn.

C. oceanica (Mitt.) Steph.		N	
<i>Lejeunea oceanica</i> Mitt.			

43. Cheilolejeunea (Spr.) Schiffn.

C. ceylanica (Gott.) Kachroo & Schust.		N	
<i>Lejeunea ceylanica</i> Gott.			
C. falsinervis (Sande Lac.) Kachroo & Schust.	S		
<i>Lejeunea falsinervis</i> Sande Lac.			
C. intertexta (Lindenb.) Steph.	S	N	
<i>Lejeunea intertexta</i> Lindenb.			
C. longidens (Steph.) Kachroo & Schust.	S	N	
<i>Pycnolejeunea longidens</i> Steph.			
C. mimosa (J.D.Hook. & Tayl.) Schust.	S	N	
<i>Jungermannia mimosa</i> J.D.Hook. & Tayl.			
C. serpentina (Mitt.) Mizut.		N	
<i>Lejeunea serpentina</i> Mitt.			
C. trifaria (Reinw., Blume & Nees) Mizut.	S	N	
<i>Jungermannia trifaria</i> Reinw., Blume & Nees			
<i>Euosmolejeunea baileyana</i> Steph.			

C. vittata (Steph. ex Hoffm.) Schust.	S	N	
<i>Pycnolejeunea vittata</i> Steph. ex Hoffm.			
44. Pycnolejeunea (Spr.) Schiffn.			
P. grandiocellata Steph.		N	
45. Lejeunea Libert			
L. apiculata Sande Lac.	S	N	
L. armitii (Steph.) Steph.	S		‡
<i>Eulejeunea armitii</i> Steph.			
L. caespitosa Lindenb.	S	N	‡
L. cucullata (Reinw., Blume & Nees) Nees	S	N	
<i>Jungermannia cucullata</i> Reinw., Blume & Nees			
L. cuspidistipula (Steph.) Steph.	S	N	
<i>Eulejeunea cuspidistipula</i> Steph.			
L. discreta Lindenb.	S	N	
L. drummondii Tayl.	S		
<i>L. tumida</i> Mitt.			
L. exilis (Reinw., Blume & Nees) Grolle		N	
<i>Jungermannia exilis</i> Reinw., Blume & Nees			
L. flava (Sw.) Nees subsp. orientalis Schust.	S	C	N (17)
<i>Eulejeunea flava</i> (Sw.) Steph.			
L. herzogii Mizut.		N	
L. punctiformis Tayl.	S		
L. sordida Nees		N	
<i>Hygrolejeunea sacculifera</i> Steph.			
46. Harpalejeunea (Spr.) Schiffn.			
H. filicuspis (Steph.) Mizut.	S	N	
<i>Drepanolejeunea filicuspis</i> Steph.			
47. Leucolejeunea Evs.			
L. xanthocarpa (Lehm. & Lindenb.) Evs.		N	
<i>Jungermannia xanthocarpa</i> Lehm. & Lindenb.			
48. Drepanolejeunea (Spr.) Schiffn.			
D. angustifolia (Mitt.) Grolle		N	
<i>Lejeunea angustifolia</i> Mitt.			
D. levicornua Steph.		N	
D. micholitzii Steph. var. micholitzii		N	‡
<i>D. micholitzii</i> Steph. var. <i>genuina</i> Herz.			
D. obliqua Steph.		N	‡
D. tenuis (Nees) Steph.		N	‡
<i>Lejeunea tenuis</i> Nees			

(17) All specimens of *Lejeunea flava* are here considered as *L. flava* subsp. *orientalis*. Whether other subspecies or varieties exist in Queensland is not known at this stage.

D. ternatensis (Gott.) Steph. <i>Lejeunea ternatensis</i> Gott.	S		N	
D. vesiculosa (Mitt.) Steph. <i>Lejeunea vesiculosa</i> Mitt.	S			
49. Leptolejeunea (Spr.) Schiffn.				
L. denticulata Steph.			N	‡
L. epiphylla (Mitt.) Steph. <i>Lejeunea epiphylla</i> Mitt.			N	
L. maculata (Mitt.) Schiffn. <i>Lejeunea maculata</i> Mitt.	S		N	
50. Colura (Dumort.) Dumort.				
C. australiensis Jovet			N	
C. bisvoluta Herz. & Jovet	S			
C. herzogii Jovet-Ash.			N	
51. Cololejeunea (Spr.) Schiffn.				
C. amphibolus Thiers			N	
C. floccosa (Lehm. & Lindenb.) Steph. <i>Jungermannia floccosa</i> Lehm. & Lindenb.			N	
C. leonidens Benedix			N	
C. mamillata (Aongst.) Hodgs. <i>Lejeunea mamillata</i> Aongst.	S			
C. maritima Tixier	S	C	N	(18)
C. minutissima (Sm.) Schiffn. <i>Jungermannia minutissima</i> Sm.	S			
C. trichomanis (Gott.) Steph. <i>Lejeunea trichomanis</i> Gott. <i>Physocolea trichomanis</i> (Gott.) Steph.			N	
C. wightii Steph.	S			

METZGERIALES

Fossombroniaceae

52. Fossombronia Raddi

F. papillata Steph.	S		N	
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Pallaviciniaceae

53. Pallavicinia S.F.Gray

P. lyellii (Hook.) S.F.Gray <i>Jungermannia lyellii</i> Hook. <i>Steetzia lyellii</i> (Hook.) Lehm.	S	C		
---	---	---	--	--

(18) There is considerable variation between specimens from northern and southern regions and there could well be more than one species involved.

54. Symphyogyna Nees

S. irregularis Steph.			N	‡
S. podophylla (Thunb.) Mont. & Nees	S		N	‡
<i>Jungermannia podophylla</i> Thunb.				
<i>Symphyogyna obovata</i> (J.D.Hook. & Tayl.) Nees				
S. pulchra Tayl.			N	

Hymenophytaceae**55. Hymenophyton Dumort.**

H. flabellatum (Labill.) Dumort. ex Trev.	S	C		
<i>Jungermannia flabellata</i> Labill.				
<i>Symphyogyna flabellata</i> (Labill.) Mont.				

Aneuraceae**56. Aneura Dumort.**

A. athertonensis Hewson			N	
A. eachamensis Hewson			N	
57. Riccardia S.F.Gray				
R. babindae Hewson			N	
R. bipinnatifida (Col.) Hewson	S		N	
<i>Aneura bipinnatifida</i> Col.				
R. bliklika Hewson			N	
R. crassa (Schwaegr.) Carr. & Pears.	S			‡
<i>Jungermannia crassa</i> Schwaegr.				
<i>Aneura stolonifera</i> Steph.				
R. hypipamensis Hewson			N	
R. macdonaldiana Hewson			N	
R. rupicola (Steph.) Hewson	S	C	N	
<i>Aneura rupicola</i> Steph.				
R. wattiana (Steph.) Hewson	S	C	N	
<i>Aneura wattiana</i> Steph.				

Metzgeriaceae**58. Metzgeria Raddi**

M. australis Steph.	S			
M. conjugata Lindb.			N	
M. decipiens (Massal.) Schiffn. & Gott.	S			
<i>M. furcata</i> (L.) Dumort. var. <i>decipiens</i> Massal.				
M. furcata (L.) Dumort.	S	C	N	
<i>Jungermannia furcata</i> L.				
M. leptoneura Spr.	S	C	N	
<i>Metzgeria hamata</i> Lindb.				
M. saccata Mitt.	S			
<i>Austrometzgeria saccata</i> (Mitt.) Kuwahara				

MARCHANTIALES

Targioniaceae

59. Targionia L.

T. hypophylla L.

I

Lunulariaceae

60. Lunularia Adanson

L. cruciata (L.) Dumort.

S

Marchantia cruciata L.

L. vulgaris Micheli ex Raddi

Aytoniaceae

61. Reboulia Raddi

R. hemisphaerica (L.) Raddi

S

N

Marchantia hemisphaerica L.

Asterella hemisphaerica (L.) Beauv.

Plagiochasma queenslandicum Steph.

62. Plagiochasma Lehm. & Lindenb.

P. rupestre (Forst.) Steph.

S

N

I

Aytonia rupestre Forst.

P. australe Nees

63. Asterella Beauv.

A. australis (J.D.Hook. & Tayl.) Verd.

S

‡

Fimbriaria australis J.D.Hook. & Tayl.

A. conocephala (Steph.) Schust.

S

‡

Fimbriaria conocephala Steph.

A. drummondii (J.D.Hook. & Tayl.) Schust.

S

N

Fimbriaria drummondii J.D.Hook. & Tayl.

A. whiteleggeana (Steph.) Schust.

N

Fimbriaria whiteleggeana Steph.

Marchantiaceae

64. Marchantia L.

M. berteroana Lehm. & Lindenb.

S

(19)

Marchantia tabularis Nees

M. foliacea Mitt.

S

N

I

Marchantia pallida Steph.

Marchantia pileatea Mitt.

M. polymorpha L.

S

(19)

(19) The first authenticated record of *Marchantia polymorpha* from mainland Australia was not made until 1986 (at Buderim, Queensland) although the taxon had been previously collected from the Bass Strait islands and Tasmania (Scott 1985, Scott & Bradshaw 1986). Cited occurrences of *M. polymorpha* over the years had invariably turned out to be *Marchantia berteroana*. *M. polymorpha* originated from Europe but is now considered a cosmopolitan species. The Queensland specimens appear to be *M. polymorpha* var. *aquatica* Nees but this is not yet confirmed.

65. Dumortiera Nees*D. hirsuta* (Sw.) Nees

N

Marchantia hirsuta Sw.**Ricciaceae****66. Riccia** L.*R. cartilaginosa* Steph.

S

I

(20)

R. marginata Carr. & Pears.*R. collata* Na-Thalang

I

R. multifida (Steph.) Steph.

S

N

Ricciella multifida Steph.*Riccia burnettensis* Steph.*R. muscicola* Steph.

I

Ricciella muscicola (Steph.) Steph.*R. vesiculosa* (Carr. & Pears.) Steph.

S

‡

Ricciella bullosa Link. var. *vesiculosa* Carr. & Pears.**67. Ricciocarpus** Corda*R. natans* (L.) Corda

S

C

I

Riccia natans L.

(20) There is some confusion regarding *Riccia cartilaginosa* – *R. marginata* synonymy (Na-Thaland 1980, Scott & Bradshaw 1986). The originally recorded binomial has been retained here.

ALPHABETICAL INDEX OF GENERA

Acrolejeunea	35	Leptolejeunea	49
Acromastigum	6	Lethocolea	21
Anastrophyllum	12	Leucolejeunea	47
Andrewsianthus	13	Lophocolea	17
Aneura	56	Lopholejeunea	34
Archilejeunea	37	Lunularia	60
Asterella	63		
		Marchantia	64
Ballantiopsis	24	Mastigolejeunea	33
Bazzania	5	Mastigophora	27
Brachiolejeunea	31	Metzgeria	58
Caudalejeunea	32	Notoscyphus	16
Cephaloziella	9		
Ceratolejeunea	42	Pallavicinia	53
Chandonanthus	11	Plagiochasma	62
Cheilolejeunea	43	Plagiochila	19
Chiloscyphus	18	Plagiochilion	20
Cololejeunea	51	Pleurozia	25
Colura	50	Porella	29
Cuspidatula	14	Ptychanthus	41
		Pycnolejeunea	44
Drepanolejeunea	48		
Dumortiera	65	Radula	26
		Reboulia	61
Fossombronia	52	Riccardia	57
Frullania	30	Riccia	66
		Ricciocarpus	67
Goebelobryum	22		
		Schiffneriolejeunea	36
Harpalejeunea	46	Schistochila	23
Hyalolepidozia	8	Spruceanthus	39
Hymenophyton	55	Stictolejeunea	40
		Symphyogyna	54
Jackiella	10		
Jungermannia	15	Targionia	59
		Telaranea	4
Kurzia	3	Thysananthus	38
		Trichocolea	1
Lejeunea	45		
Lepidoleana	28	Zoopsis	7
Lepidozia	2		

APPENDIX A

Literature used in Compiling the Checklist

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STUDIES ON THE AUSTRALASIAN ASCLEPIADACEAE, II* A NEW COMBINATION IN *GYMNEMA* R.BR.

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Summary

The new combination *Gymnema dunnii* based on *Marsdenia rostrata* R.Br. var. *dunnii* Maiden & Betche is made. The species is described and illustrated with notes given on distribution, habitat and conservation status.

During studies of the Australian Asclepiadaceae, it became evident that material originally described as *Marsdenia rostrata* R.Br. var. *dunnii* Maiden & Betche was referable to the genus *Gymnema*. While there is some superficial vegetative similarity to *Marsdenia rostrata*, the floral characters of this taxon are those of *Gymnema* both in the narrow sense of Huber (1983) and the broader concept favoured by Schlechter (1914).

This incorrect generic placement has been recognised by several workers (Jacobs & Pickard 1981, Williams & Harden 1981, Stanley & Ross 1986) but no attempt has been made to effect the necessary transfer. Hence, the following new combination and change of status is made.

***Gymnema dunnii* (Maiden & Betche) P. Forster, comb. et stat. nov.**

Marsdenia rostrata var. *dunnii* Maiden & Betche, Proc. Linn. Soc. New South Wales 31: 736 (1906). **Type:** New South Wales: Acacia Creek, McPherson Range, Dec 1905, J.L. Dunn (holo: NSW; iso: BRI AQ333081). In the original description of *Marsdenia rostrata* var. *dunnii*, Maiden & Betche (1906) incorrectly cite the type as 'Mrs. J.L. Dunew'.

Woody vine. Stems puberulent, twining, 1-1.5 cm thick; with coarsely fissured bark, corky, grey-brown, dark-brown when cut; with white latex. Leaves ovate, oblong-ovate to oblong-elliptic, apex acute to acuminate, base obtuse to cuneate, 2.5-8 cm long, 1.3-10.5 cm wide, yellowish-green to green above, paler beneath, finely puberulous on both surfaces with lateral and reticulate venation more prominent on abaxial surface. Petioles 0.6-4 cm long; 5-9 extra-floral nectaries present at midrib base of lamina. Stipules at either side of petiole base. Inflorescence an extra-axillary umbel with up to 7 flowers, 1(2) umbels per node; peduncles 0.3-1.2 cm long; pedicels 2-5 mm long, finely pubescent. Calyx 1.5-2 mm long, subacute to oblong, lobed from 1/2 to 3/4 length, sparsely pubescent externally. Corolla convolute; lobes acute to oblong, reflexed at anthesis, glabrous outside, sparsely shortly pubescent inside, 2-2.5 mm long; tube 2-2.5 mm long, shortly pubescent inside; corolline corona of thickened ridges running longitudinally down tube and alternate with lobes, densely pubescent on edges. Staminal column 2-2.5 mm long; corona consisting of small discrete tubercles at base; anthers with membranous tip, anther groove 0.9-1.1 mm long. Ovaries glabrous; stigma conical, 2-2.5 mm longer than staminal column. Pollinium ascending, without pellucid margin, oblong, golden, ca 140-150 µm long. Translator dark brown, ca 100 µm long. Caudicle without wings, ca 47 µm long. Follicles fusiform, 5-6 cm long. Seed light-brown, 7-8 mm long, 2-3 mm wide; coma white, 15-20 mm long. **Fig. 1.**

Specimens examined. Queensland. NORTH KENNEDY DISTRICT: Barrabas Scrub, W of Ravenswood, Apr 1943, Blake 14894 (BRI). PORT CURTIS DISTRICT: near Rockhampton, Mar 1943, Blake 14841 (BRI). BURNETT DISTRICT: Mt Perry, undated, Keys 204 (BRI); Mt Blandy, Dec 1980, Forster 532 (BRI); 4.5 km NNE of Monogorilly, Dec 1981, Forster 987 (BRI). DARLING DOWNS DISTRICT: Gladfield, undated, Gwyther 2892 (BRI), Jan 1962, Williams NSW 181362 (NSW); 5.5 km SW of Baking Board, Dec 1982, Forster 1448 (BRI); 2.5 km SSW of Gladfield, Jun 1986, Forster 2479, Bird & Grimshaw (BRI,CANB). MORETON DISTRICT: Rosewood, Dec 1886, Bailey AQ216768 (BRI), Nov 1943, Blake 15364 (BRI); near Pine Mt., Jan 1957, Blake 20084 (BRI); D'Aguilar Range, 27°15'S, 152°40'E, Apr 1972, Moriarty 914 (BRI), Aug 1972, Moriarty 963 (BRI); State Forest 309, Enoggera, Aug 1972, Moriarty 961 (BRI); Upper Brookfield, Jan 1978, Jessup 56 (BRI); Burleigh Heads National Park, Jul 1978, McDonald et al. 2202 (BRI,CANB); Worlds End Pocket, Nov 1981, Bird AQ347176 (BRI); 11 km from Croftby on White Swamp to Boonah Border Gate road, Jan 1986, Forster & Bird 2285 (BRI). New South Wales. NORTH COAST: Casino, May 1912, McAuliffe 8 (BRI,NSW); Unungar State Forest on Mt

*Continued from *Nuytsia* 6(2) (in press)

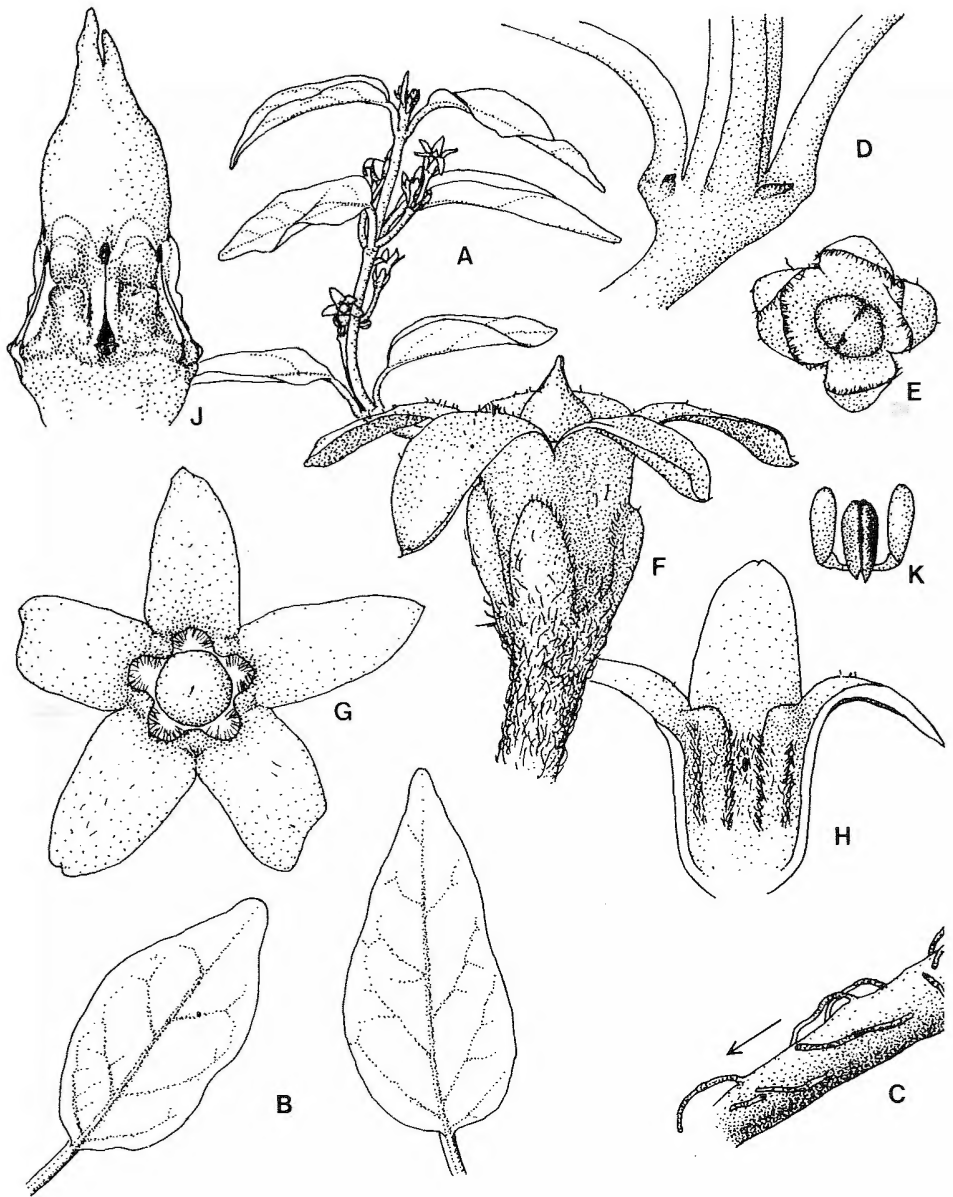


Fig. 1. *Gymnema dunnii*: A. flowering twig $\times 1 \frac{1}{3}$. B. leaves $\times 2$. C. edge of leaf, showing hairs which cover entire plant (arrow points towards leaf tip) $\times 60$. D. node, showing extra-axillary origin of inflorescence, and stipules at either side of petiole blades $\times 7$. E. calyx, showing ovaries after removal of corolla $\times 13$. F. flower, side view $\times 13$. G. flower, apical view showing hairs inside tube $\times 13$. H. transverse section of corolla showing hairy corolline corona (small dark oval in centre indicates scale and position of a translator of the pollinarium, when *in situ* on the gynostegium) $\times 13$. J. gynostegium $\times 20$. K. pollinarium $\times 75$. All from material in spirit of Forster 987.

Lindesay Hwy, between Mt Lindesay & Kyogle, Feb 1975, *Moriarty* 1646 (BRI); Glenugie Peak, near Grafton, 1964, *Hayes* NSW 181360 (NSW); Lismore, Nov 1894, *Bauerlen* 1401 (NSW); Mt Danger, NW of Sandy Hollow, Aug 1966, *Rodd* 345 (NSW). NORTHERN TABLELANDS: Acacia Ck, undated, *W. Dunn* 260 (BRI,NSW). CENTRAL WESTERN SLOPES: Bushy Hill, beside Glenbawn Dam, near Scone, Dec 1962, *Williams* 1052 (BRI), 1208 (NSW); Mt Dongal, Nov 1973, *Webster & McGillivray* 19050 (NSW); 2 miles [3.2 km] SE of Scone Experimental Stn, Mar 1960, *Story* 7068 (CANB,NSW). **Map 1.**

Habitat: *Gymnema dunnii* occurs primarily in semi-evergreen vine thickets or araucarian microphyll and notophyll vine forests (dry deciduous rainforests) on a variety of rock types from 200–700 m altitude. Plants are usually infrequent at the localities visited, usually consisting of up to a dozen large clumps (although the population 2.5 km SSW of Gladfield was extensive). The vegetation communities are usually open with high light levels and it is uncommon to encounter juveniles in heavily shaded conditions. Often the species may be found associated with other Asclepiadaceae such as *Sarcostemma australe* R.Br., *Secamone elliptica* R.Br., *Gymnema micradenium* Benth., *Marsdenia leptophylla* F.Muell. ex Benth. and species of *Parsonsia* (Apocynaceae).

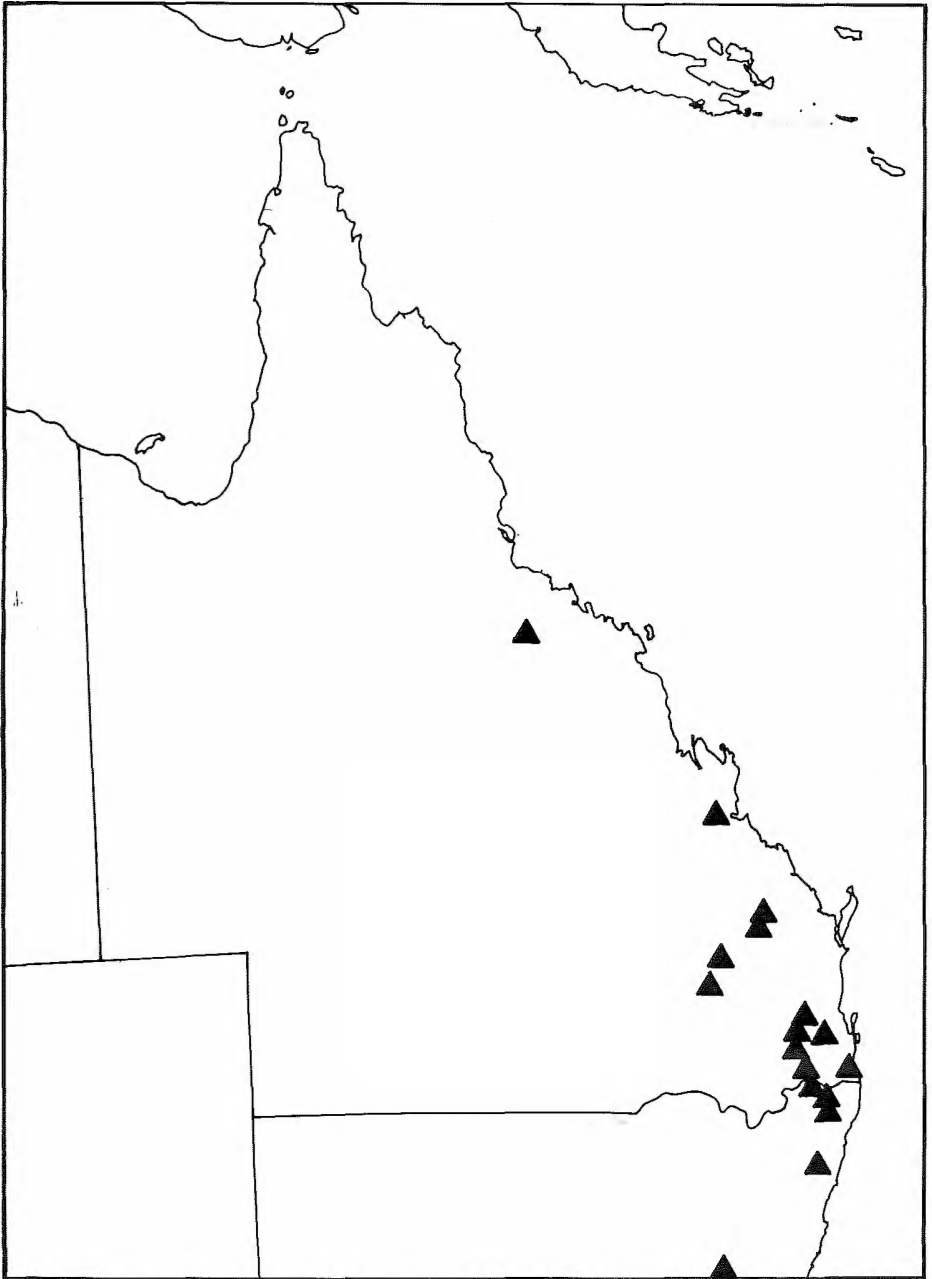
Conservation status: Given the destruction of much of the dry deciduous rainforest communities in Queensland and north-eastern New South Wales, it may be assumed that the distribution of *G. dunnii* is less extensive than in the past. The localities visited were usually regrowth remnants and unlikely to survive in the long-term. While it has been recorded from at least one conservation reserve, there does not appear to be an adequate representation throughout the species range. The plant is inconspicuous and when sterile unlikely to be collected and probably occurs at other sites within the range indicated. At this stage *G. dunnii* should not be considered endangered.

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I wish to thank Mr. K. Harold of West Yorkshire, England for providing Fig. 1., Mr. L.H. Bird of Bundamba, Ipswich for material of the species, Mr. P.D. Bostock, Botany Dept., University of Queensland for reading the manuscript, Mr L. Pedley for arranging the loan of material and the Directors of the Queensland Herbarium and National Herbarium, Royal Botanic Gardens, Sydney, for access to material.

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Map. 1. Distribution of *Gymnema dunnii* based on holdings at the Queensland Herbarium.

THREE NEW SPECIES OF *BONAMIA* THOUARS (CONVOLVULACEAE) FROM CENTRAL AUSTRALIA

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Summary

Three species, *Bonamia alatisemina*, *B. deserticola* and *B. erecta* are described as new.

In the first edition of the Flora of Central Australia (Jessop 1981), two taxa were described, *Bonamia* sp. aff. *B. linearis* and *B.* sp. aff. *B. oblongifolia*, which appeared at the time to be worthy of specific rank. Further studies and the availability of more recent collections have confirmed this opinion. In addition, a third species included under *B. rosea* in the Flora is described as new.

Bonamia alatisemina R.W. Johnson, **sp. nov.** affinis *B. linearis* (R.Br.) H. Hallier, sed petiolis brevioribus, foliis angustioribus et seminibus anguste alatis. **Typus:** Western Australia: McLarty Hills, Great Sandy Desert, 8 Aug 1977, *A.S. George* 14727 (holo: PERTH; iso: BRI).

Planta perennis. Caules repentes, modice ad dense piliferi; pili bifurcati, brachiis appressis. Folia simplicia; lamina linearis ad peranguste ovata, acuta, basi angustata, 1.5-4 cm longa, 1.5-2.5 mm lata; petiolus minus quam 1.5 mm longus. Inflorescentia axillaris; pedunculus usque ad 1.5 mm longus, 1-florus; bracteolae oppositae, lineares, acutae, 1-3 mm longae, persistentes; pedicellus 3-6.5 mm longus. Sepala exteriora ovata ad ovato-elliptica, acuta vel vix obtusa, basi rotundata, 5-7.5 mm longa, 2.5-3.5 mm lata; interiora ovata ad ovato-acuminata, amplitudinis similis. Corolla infundibuliformis, erubescens, ca 10 mm longa, limbus ca 13 mm latus, taeniis meso-petalinis sericeis. Stamina 5, filamenta inaequalia, 3-4 mm longa, 4.5-5 mm supra basin corollae inserta. Ovarium ellipsoideum, 2-loculare; styli 2, 8-9 mm longi, 2 mm in parte inferiore connati, uterque stigmate globulari. Capsula ovoidea, basi styli persistenti, glabra vel ad apicem pilis paucis, 2-locularis, ca 6 mm alta. Semina 4, laevia, alis angustis, 2.5-3 mm longa.

Perennial plant with trailing branches, moderately to densely hairy; hairs biramous with appressed arms. Leaves simple; blade linear to very narrowly ovate, acute, tapering at the base, 1.5-4 cm long, 1.5-2.5 mm broad; petiole less than 1.5 mm long. Inflorescence axillary; peduncle up to 1.5 mm long, bearing 1 flower; bracteoles opposite, linear, acute, 1-3 mm long, persistent at fruiting; pedicel 3-6.5 mm long. Outer sepals ovate to ovate-elliptic, acute or barely obtuse, rounded at the base, 5-7.5 mm long, 2.5-3.5 mm broad; inner sepals ovate to ovate-acuminate of similar size. Corolla funnel-shaped, pale pink, ca 10 mm long, limb ca 13 mm broad, with hairy mid-petaline bands. Stamens 5; filaments unequal in length, 3-4 mm long, affixed 4.5-5 mm above the base of the corolla. Ovary ellipsoid, 2-locular; styles 2, 8-9 mm long, fused in the lower 2 mm, each with a globular stigma. Capsule ovoid with a persistent style base, glabrous or with a few hairs at the apex, 2-locular, ca 6 mm tall. Seeds 4, smooth, with a narrow wing, 2.5-3 mm long.

Selected Specimens. Western Australia. McLarty Hills, Great Sandy Desert, Aug 1977, *George* 14727 (PERTH, BRI); Ankettell Ridge, Great Sandy Desert, May 1979, *Mitchell* 1122 (NT), *Mitchell* 1141 (NT). Northern Territory. The Granites tenements, Tanami Desert, Dec 1984, *Kalotas* 1691 (NT).

Distribution: An Australian endemic species, known only from the Great Sandy Desert in Western Australia and the Tanami Desert in the Northern Territory.

Ecology: It grows on sand plains.

Flowering and Fruiting: It flowers in the spring and early summer with fruit being produced into the late summer and autumn.

Affinities: It resembles most closely *Bonamia linearis* which is a mainly coastal and subcoastal species found across northern Australia from the Kimberley to Cape York Peninsula. It differs from *B. linearis* in having winged seeds and narrower leaves with shorter petioles.

Bonamia deserticola R.W. Johnson, *sp. nov.* affinis *B. oblongifoliae* Myint, sed pedicellis longioribus, sepalis et corollis magnis et floribus albis non caeruleis. **Typus:** Northern Territory: Lake Surprise Area, 10 Mar 1973, *N.M. Henry* 633 (holo: NT 38267; iso: NSW,CANB).

Planta perennis. Caules repentes, modice et dense piliferi; pili bifurcati, brachiis appressis. Folia simplicia; lamina oblonga ad ovato-oblonga, basi et apice obtusa ad abrupte acuta, 1–2.5 cm longa, 2.5–6 mm lata; petiolus 1–4 mm longus. Inflorescentia axillaris; pedunculus $\pm$ absens, flore solitaris; bracteolae oppositae, lineares, acutae, 1–2 mm longae, persistentes; pedicellus 2–5 mm longus. Sepala exteriora ovata, acuta, basin versus contracta, 4.5–6 mm longa, 2–2.5 mm lata; interiora ovata, acuminata, amplitudinis similis. Corolla infundibuliformis, alba, ca 5–7 mm longa, limbus ca 8–10 mm latus, taeniis meso-petalinis sericeis. Stamina 5; filamenta inaequalia, 3.5–5 mm longa, 1.5–2.5 mm supra basin corollae inserta. Ovarium ovoideum, 2-loculare; styli 2, 5–9 mm longi, 2–4 mm in parte inferiore connati, uterque stigmate globulari. Capsula ovoidea, basi styli persistenti, ad apicem coma, 2-locularis, ca 5 mm alta. Semina 4, glabra.

Perennial with trailing branches, moderately to densely hairy; hairs biramous with appressed arms. Leaves simple; lamina oblong to ovate oblong, obtuse to abruptly acute at both apex and base, 1–2.5 cm long, 2.5–6 mm broad; petiole 1–4 mm long. Inflorescence axillary; peduncle $\pm$ absent; bracteoles opposite, linear, acute, 1–2 mm long, persistent at fruiting; pedicel 2–5 mm long. Outer sepals ovate, acute, tapering towards the base, 4.5–6 mm long, 2–2.5 mm broad; inner sepals ovate, acuminate, of similar size. Corolla funnel-shaped, white, ca 5–7 mm long, limb ca 8–10 mm diameter, with a hairy mid petaline band. Stamens 5; filaments unequal, 3.5–5 mm long, affixed 1.5–2.5 mm above the base of the corolla. Ovary ovoid, 2-locular; styles 2, 5–9 mm long, fused in the lower 2–4 mm, each with a globular stigma. Capsule ovoid with a persistent style base, with a tuft of hairs at the tip, 2-locular, ca 5 mm tall. Seeds 4, glabrous.

Selected Specimens. Northern Territory. 65 m [105 km] NW of Willowra, Jul 1958, *Chippendale* NT 4794 (NT,NSW); 40 m [64 km] NW The Granites, Mar 1962, *Mahood* NT 8735 (NT); Lake Surprise Area, Mar 1973, *Henry* 633 (NT,NSW,CANB).

Distribution: An Australian endemic species currently known only from a restricted area in the vicinity of Lake Surprise and The Granites in the Northern Territory.

Ecology: It has been recorded from hummock grassland on deep red sands and from grey silty loams in dry depressions with *Eucalyptus papuana*.

Flowering and Fruiting: It flowers from spring to late summer with fruit being produced in the summer and autumn.

Affinities: It resembles most closely *B. oblongifolia* Myint which is known only from the type locality at Broome, Western Australia. It differs from *B. oblongifolia* in having longer peduncles, sepals and corolla. It has white flowers, not blue as in *B. oblongifolia*.

Bonamia erecta R.W. Johnson, *sp. nov.* affinis *B. roseae* (F.Muell.) H. Hallier, sed floribus et bracteolis parvioribus. **Typus:** Northern Territory: 8 km E of Mt Olga circuit road, 30 Sep 1979, *R.W. Johnson* 3369 (holo: BRI 255233; iso: BRI, DNA).

Planta perennis. Caules erecti vel ascendentes usque ad 60 cm alti, lignescentes, dense coacti; pili bifurcati, brachiis ascendentibus. Folia simplicia; lamina oblonga, elliptica vel ovato-elliptica, obtusa vel rotundata, basi rotundata, 5–15 mm longa, 3–11 mm lata, utrinque coacta; petiolus absens vel raro usque ad 2 mm longus. Inflorescentia axillaris; pedunculus $\pm$ absens; bracteolae oppositae, peranguste triangulares ad lineares, acutae, 2–3 mm longae, persistentes; pedicellus usque ad 2 mm longus. Sepala exteriora, ovata ad ovato-lanceolata, acuta, basi obtusa ad rotundata, 5–6 mm longa, 2–3 mm lata, coacta; interiora ovata ad ovato-acuminata, longitudinis similis sed basi latiora. Corolla infundibuliformis, alba, 8–10 mm longa, limbus 10–12 mm latus, taeniis meso-petalinis sericeis. Stamina 5; filamenta $\pm$ aequilongae, 4.5–5 mm long, 3–4 mm supra basin corollae inserta. Ovarium ovoideum ad subglobosum, 2-loculare; styli 2, inaequilongae, 6–8 mm

longi, 4–5 mm in parte inferiore connati, uterque stigmatibus globulari. Capsula conica, ad apicem coma, 2-locularis. Semina 4, glabra.

Perennial with erect or ascending branches, to ca 60 cm tall. Branches becoming woody, densely felted with biramous hairs, arms ascending. Leaves simple; blade oblong, elliptic or ovate-elliptic, obtuse or rounded, rounded at the base, 5–15 mm long, 3–11 mm broad, densely felted on both sides; petiole $\pm$ absent, rarely to 2 mm. Inflorescence axillary; peduncle $\pm$ absent; bracteoles opposite, narrowly triangular to linear, acute, 2–3 mm long, persistent at fruiting; pedicel up to 2 mm long. Outer sepals ovate to ovate-lanceolate, $\pm$ acuminate, acute, base obtuse to rounded, 5–6 mm long, 2–3 mm broad, densely felted; inner sepals ovate to ovate-acuminate, of similar length but broader at the base. Corolla funnel-shaped, white, 8–10 mm long, limb 10–12 mm diameter, with a sericeous mid-petaline band. Stamens 5, filaments $\pm$ equal in length, 4.5–5 mm long, affixed 3–4 mm above the base of the corolla. Ovary ovoid to sub-globular, 2-locular; styles 2, unequal in length, 6–8 mm long, fused in the lower 4–5 mm, each with a globular stigma. Capsule conical, 2-locular with a tuft of hairs at the tip. Seeds 4, glabrous.

Selected Specimens. Northern Territory. 31.6 m [51 km] NW Mt Patricia, May 1958, *Chippendale* NT 4297 (NT,BRI); ca 2 m [3 km] E of Ayers Rock, Sep 1968, *Nicholls* 973 (NT,BRI); 100 m [161 km] W of Ayers Rock, Sep 1979, *Maconochie* 742 (NT, PERTH); Between Hermannsburg Mission and Areyonga, 35 km from Hermannsburg, Sep 1979, *Johnson* 3358 (BRI,NT); 8 km E of Mt Olga Circuit Rd, Sep 1979, *Johnson* 3369 (BRI,NT). South Australia. FAR NORTH WEST: Musgrave Ranges, ca 65 km W of Musgrave Park, Sep 1963, *Whibley* 973 (AD), *Eichler* 17295 (AD). Western Australia. 5 m [8 km] W of Mt Webb, Jul 1967, *George* 9032 (NT,PERTH).

Distribution: An Australian endemic species, occurring throughout the desert regions of the Northern Territory, Western Australia and South Australia.

Ecology: It occurs on red and yellow sand plains and dunes in hummock grasslands (*Triodia pungens*), often with an overstorey of *Acacia* spp. and *Casuarina decaisneana*.

Flowering and Fruiting: It flowers in the spring and produces fruit in the autumn. No collections have been made in the summer.

Affinities: It is most closely related to *Bonamia rosea* (F.Muell.) H. Hallier which is found in coastal Western Australia. It differs from *B. rosea* in having smaller bracteoles and corolla.

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TWO NEW SPECIES OF *CONVOLVULUS* L. (CONVOLVULACEAE) FROM SOUTH AUSTRALIA

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Summary

Two species of *Convolvulus*, *C. eyreanus* and *C. microsepalus* are described as new. They are currently known only from South Australia.

In preparing an account of *Convolvulus* for the Flora of South Australia (Johnson 1986), two taxa, which appeared to be undescribed, were segregated from the highly variable material grouped under *C. erubescens* Sims. Prior to the publication of Flora Australiensis Vol. IV (Bentham 1869), eight native taxa had been recognised but Bentham chose to incorporate this variation within *C. erubescens*. This species was originally described from a plant of New South Wales origin cultivated in 1806 in the Royal Botanic Gardens, Kew. Since the release of the Flora of South Australia, type specimens of most of these taxa have been studied and none is representative of the two taxa described in this paper.

Convolvulus eyreanus R.W. Johnson, **sp. nov.** affinis *C. clementii* Domin, sed foliis sericeis et lobatis minus profunde. **Typus:** South Australia: Lake Frome East, ca 40 km ENE of Frome Downs Homestead, 23 Jul 1971, *N.N. Donner* 3531 (holo: AD; iso: Altona Springs, Oshkosh *n.v.*).

Planta perennis. Caules repentes et volubiles, dense sericei. Folia simplicia; lamina ovata ad oblonga, acuta ad rotundata, mucronulata, margine serrato ad parvilobo, basi lobis saepe plus prominentibus, 10-30 mm longa, 8-16 mm lata, utrinque dense sericea. Inflorescentia axillaris, cymosa; pedunculus gracilis, 12-22 mm longus, 1-(2-3) floribus; bracteolae anguste triangulares ad subulatae, 1-3 mm longae; pedicellus 1-10 mm longus. Sepala exteriora concava, obovata ad obovato-elliptica, rotundata ad obtusa, apiculo brevi recurvato, 4-5.5 mm longa; interiora obovata, abrupte acuminata, 3.5-4.5 mm longa. Corolla infundibuliformis, albida ad rosea, 6-8 mm longa, limbus 8-9 mm latus, praeter pilosum apicem taeniarum meso-petalinarum glabra. Stamina 5; filamenta leviter inaequalia, 2-2.3 mm longa, 1.8-2 mm supra basin corollae inserta. Ovarium ovoideum, 2-loculare; stylus 2.7-3 mm longus, stigmata duo linearia 1-1.4 mm longa. Capsula globularo-ovoidea, basi styli persistenti, 2-locularis, 6-7 mm alta, basi circumscissa, bivalvis, dissepimento persistenti. Semina 4, alto-brunnea, 3.5-4 mm longa, glabra, verrucosa, ala angusta, interrupta in marginibus exterioribus.

Perennial plant with trailing and twining, sericeous stems. Leaves simple; blade ovate to oblong, acute to rounded, mucronulate, with a serrate to shallowly-lobed margin, the basal lobes often more prominent, 10-30 mm long, 8-16 mm broad, densely sericeous on both sides. Inflorescence axillary, cymose; peduncle slender, 12-22 mm long, bearing 1, rarely 2 or 3 flowers; bracteoles narrowly triangular to subulate, 1-3 mm long; pedicels 1-10 mm long. Outer sepals concave, obovate to obovate-elliptic, apex rounded to obtuse with a short recurved apiculum, 4-5.5 mm long; inner sepals obovate, abruptly acuminate, 3.5-4.5 mm long. Corolla funnel-shaped, off-white to pink, 6-8 mm long, limb 8-9 mm diameter, glabrous except for some appressed hairs at the tip of the mid-petaline bands. Stamens 5; filaments slightly unequal in length, 2-2.3 mm long, affixed 1.8-2 mm above the base of the corolla. Ovary ovoid, 2-locular; style 2.7-3 mm long, bearing 2 linear stigmas 1-1.4 mm long. Capsule globular-ovoid with a persistent style base, 2-locular, 6-7 mm high, circumscissile at the base, splitting into 2 valves with a persistent dissepiment. Seeds 4, dark brown, 3.5-4 mm long, glabrous, verrucose, with a narrow, interrupted wing on the outer margins. **Fig. 1A-C.**

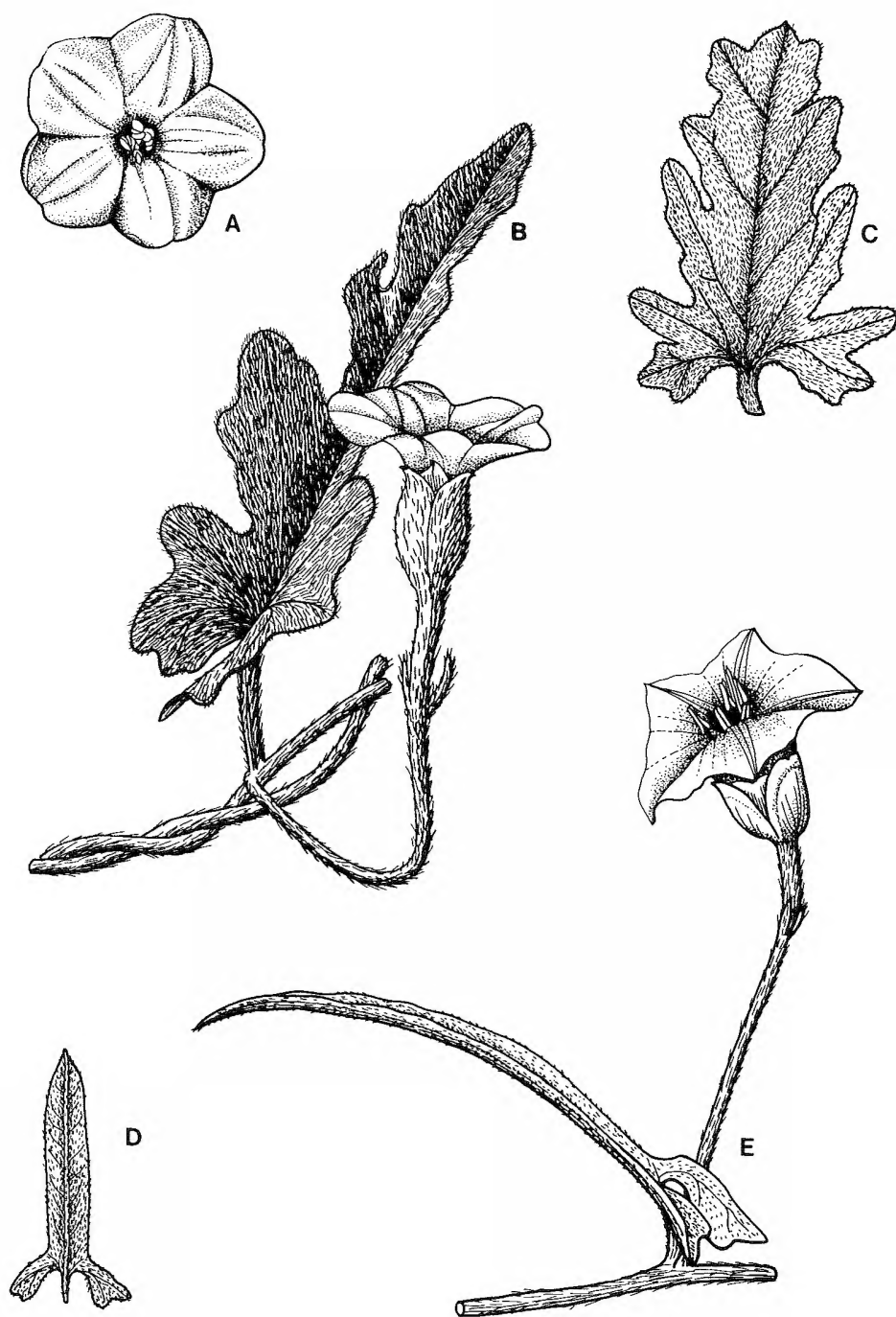


Fig. 1. *Convolvulus eyreanus*: A. Corolla showing limb and throat $\times 4$. B. Inflorescence and subtending leaf $\times 4$. C. Leaf $\times 2$. C. *microsepalus*: D. Leaf $\times 2$. E. Inflorescence and subtending leaf $\times 4$.

Selected specimens. South Australia. LAKE EYRE REGION: Far NE, Birdsville track, Mt Gason Bore ca 250 km NE of Marree, Sep 1960, *Filson* 3330 (AD, MEL *n.v.*); Ca 30 km NW of Muloorina H.S., Sep 1963, *Hill* 1170 (AD); Callanna, Sep 1966, *South Australian Pastoral Board* s.n. (AD); Central Hunt Peninsula, just N of Muloorina H.S., Sep 1968, *Cornwall* 109 (AD). GAIRDNER-TORRENS REGION: Mulgaria [30°14'S, 137°39'E], Aug 1955, *South Australian Pastoral Board* s.n. (AD). FLINDERS RANGE REGION: Ca 8 km W of Yalakina Dam, ca 30 km NW of Leigh Creek, Nov 1964, *Lothian* 3385 (AD). EASTERN REGION: Lake Frome East, ca 40 km ENE of Frome Downs Homestead, Jul 1971, *Donner* 3531 (AD); Lake Frome East, Billeroo Creek Area, ca 45 km ENE of Frome Downs Homestead, Jul 1971, *Whibley* 3455 (AD).

Distribution: It occurs throughout the north-eastern parts of South Australia in the basins of Lake Eyre, Lake Torrens and Lake Frome.

Ecology: It has been recorded from sand dunes and on gibber plains in desert regions.

Flowering and Fruiting: Flowering occurs mainly in spring and early summer but flowers can occur at most times of the year. Fruiting begins in the late spring.

Affinities: It most closely resembles *C. clementii* Domin but is clearly distinguished by its dense silvery indumentum, and more serrate and more shallowly-lobed leaves. It differs from *C. erubescens* Sims in having much smaller flowers, with petals less than 10 mm long. In the northern parts of the Eyre and Yorke Peninsulas is a form with small, serrate, silvery leaves which may prove taxonomically distinct.

Etymology: The specific epithet refers to the name Eyre in Lake Eyre and the Eyre region of South Australia, both named in honour of Edwin John Eyre (1815–1901), explorer.

Convolvulus microsepalus R.W. Johnson, *sp. nov.* affinis *C. remoto* R.Br., sed sepalis multo parvioribus, emarginatis et glabris. **Typus:** South Australia, Flinders Ranges: ca 51 km N of Quorn on the Quorn to Hawker road, 8 Nov 1970, *A.E. Orchard* 2626 (holo: AD; iso: NCU, COLO *n.v.*).

Planta perennis. Caules repentes et volubiles, modice ad sparsim piliferi; pili breves, appressi. Folia simplicia; lamina linearis ad anguste triangularis, acuta ad obtusa, basi auriculata ad sagittata, lobis basi integris vel bidentatis, 10–50 mm longa, 3–20 mm lata, indumentum idem atque in caule. Inflorescentia axillaris; pedunculus gracilis, 8–16 mm longus, flore solitario; bracteolae anguste triangulares ad lineares, 0.7–1.5 mm longae; pedicellus 3–8 mm longus. Sepala exteriora concava, lata ovata, apice rotundata, ± emarginata, 2–2.5 mm longa, 2–3 mm lata, glabra; interiora similia sed parum parviora. Corolla infundibuliformis, alba vel erubescens, 6–8 mm longa, ± glabra. Stamina 5; filamenta leviter inaequalia, 1.8–2.2 mm longa, 1–1.5 mm supra basin corollae inserta. Ovarium ovoideum, 2-loculare; stylus 1.5–2 mm longus; stigmata duo linearia, 1.2–1.7 mm longa. Capsula globulosa, basi styli persistenti, 2-locularis, 6–7 mm alta, basi circumscissa, bivalvis, dissepimento persistenti. Semina 4, alto-brunnea ad mellea, 2.5–4 mm longa, glabra, verrucosa.

Perennial plant with trailing and twining, moderately to sparsely hairy stems; hairs short, appressed. Leaves simple; blade linear to narrowly triangular, acute to obtuse, auriculate to sagittate at the base, basal lobes entire or 2-toothed, rarely with a secondary pair of ascending teeth or lobes, 10–50 mm long, 3–20 mm broad, indumentum as for the stems. Inflorescence axillary; peduncle slender, 8–16 mm long, bearing a solitary flower; bracteoles subulate to linear, acute, 0.7–1.5 mm long; pedicel 3–8 mm long. Outer sepals concave, broadly ovate, rounded, ± emarginate at the apex, 2–2.5 mm long, 2–3 mm broad, glabrous; inner sepals similar in shape but slightly smaller. Corolla funnel-shaped, white or pink, 6–8 mm long, ± glabrous. Stamens 5; filaments slightly unequal in length, 1.8–2.2 mm long, affixed 1–1.5 mm above the base of the corolla. Ovary ovoid, 2-locular; style 1.5–2 mm long, bearing 2 linear stigmas, 1.2–1.7 mm long. Capsule globular with a persistent style base, 2-locular, 6–7 mm tall, circumscissile at the base, splitting into 2 valves, leaving a persistent dissepiment. Seeds 4, dark brown to honey-coloured, 3.5–4 mm long, glabrous, verrucose. **Fig. 1D–E.**

Specimens examined. South Australia. LAKE EYRE REGION: 1 km S of Paradise Creek, ca 40 km S of Marree, Apr 1978, *Badman* (AD). NULLARBOR REGION: Nullarbor National Park, Murrawijinie Caves, Aug 1980, *Donner* 7173 (AD). FLINDERS RANGE REGION: 8 ml [12.8 km] E of Wilmington, Mar 1959, *Filson* 809 (MEL, AD); ca 16 km N of Hawker, Apr 1966, *Copley* 192 (AD); Oak Park Homestead, ca 50 km S of Yunta, Mar 1969, *Pfeiffer* s.n. (AD); ca 51 km N of Quorn on the Quorn to Hawker road, Nov 1970, *Orchard* 2626 (AD, NCU, COLO). EASTERN REGION: ca 3 km N of Curnamona Homestead, Apr 1968, *Orchard* 211 (AD); ca 6 km NE of Curnamona (Arkipena Springs road), Apr 1968, *Barker* 454 (AD). NORTHERN LOFTY REGION: Reserve between Gladstone and Laura, Nov 1920, *J.M. Black herb* (AD).

Distribution: It is currently known only from South Australia.

Ecology: It grows in chenopod shrublands on sandy plains. Indications from the few specimens collected are that it is not of common occurrence.

Flowering and Fruiting: The main flowering period is during the spring to early autumn but occasional flowers have been recorded at other times. Capsules are produced from the late spring onwards.

Affinities: It most closely resembles *C. remotus* R.Br. in leaf-shape and indumentum. However the sepals of *C. remotus* are about twice as long, are apiculate, not $\pm$ emarginate, and are hairy. The flowers of *C. remotus* are also much larger. The sepals of *C. microsepalus* most closely resemble those of *C. arvensis* L. but the latter has a corolla at least twice as large. *C. erubescens* also has a much larger calyx and corolla.

Etymology: The specific epithet refers to the size of the sepals which are by far the smallest for any species of *Convolvulus* recorded from Australia.

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A NEW SPECIES OF *ISOTROPIS* BENTH. AND A NEW RECORD OF *DAVIESIA* SMITH (FABACEAE: MIRBELIEAE) FROM QUEENSLAND

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Summary

Isotropis foliosa is described as new and distinguished from its relatives. It is restricted to two known localities in south-eastern Queensland. A key to Queensland species of *Isotropis* is provided. The discovery in Queensland of *Daviesia arthropoda* F.Muell., a central Australian species, is reported.

Isotropis Benth. is a genus of about a dozen species distributed in western, central and north-eastern Australia. Although belonging to the endemic Australian tribe *Mirbelieae*, the genus is somewhat anomalous, and its position within the tribe is uncertain (Crisp & Weston 1987). During a recent visit to the Queensland Herbarium, my attention was drawn to an apparently undescribed species of *Isotropis*. Subsequent examination of a population in the field confirmed its novel status.

The newly discovered species, while showing all the essential characters of *Isotropis*, is remarkable in two respects. One is that it extends the known range of the genus to the south in eastern Australia. The other is that its leaves are more developed than those of any of its congeners.

Isotropis foliosa Crisp, sp. nov.

Suffrutex ad 0.4 m altus cinereo-sericeus glabrescens. Foliis unifoliolatis. Foliolo deflexo ovato, 12-35 mm longo, 10-23 mm lato, herbaceo. Floribus 12-15 mm longis, 2-10 vel magis in racemis terminalibus (folio oppositis). Calyce 8-11 mm longo, cinereo-sericeo, paene ad basin in labium supernum lineare emarginatum et lobos tres inferos angustotriangulares diviso. Vexillo latissime ovato, ca 13 mm longo, ca 16 mm lato; alis angustobovatis, ca 13 mm longis; carina semi-elliptica, ca 12 mm longa. Stamina 10 liberis unifloribus; antheris versatilibus. Ovario ovulis plurimis. Legumine immaturo oblique angustobovoido, turgido, 15-25 mm longo, 4-6 mm lato. **Typus:** Queensland, D'Aguilar Range, ca 13 km NE of Ipswich, 29 Aug 1986, M.D. Crisp 7834 & I.R. Telford (holo: CBG; iso: BRI,K).

Subshrub with several freely branched stems arising to 40 cm from a woody rootstock; initially grey-sericeous, glabrescent. Leaves scattered, unifoliolate. Leaflet deflexed, ovate, obtuse or acute, slightly undulate, truncate or very obtuse at the base, 12-35 mm × 10-23 mm, sparsely sericeous, glabrescent, thin, soft, green. Petiole ascending, slender, 7-15 mm long. Petiolule geniculate at junction with petiole, ca 1 mm long. Stipules inconspicuous, subulate, 1-2 mm long. Seedling leaves similar but smaller. Leaflet ca 10 mm × 7 mm. Petiole 4-6 mm long. Inflorescence a terminal (leaf-opposed) raceme, with 2-10 or more flowers. Rachis 4-15 cm long. Bracts narrow-triangular, 2-3 mm long. Anthesis acropetal, one flower open at a time. Flower 12-15 mm long. Pedicel 6-9 mm long. Bracteoles situated at summit of pedicel, subulate, ca 1.5 mm long. Calyx divided to near base into an upper lip and three lower lobes, grey-sericeous; tube ca 2 mm long; lobes very slightly imbricate; upper lip linear, emarginate, 6-9 mm long; lower lobes narrow-triangular, equal to upper lip, acute. Corolla: standard very broad-ovate, retuse, slightly cordate, ca 13 mm × 16 mm including 2.5 mm claw, orange with purple veins and a bright yellow spot at base; wings narrow-obovate, auriculate, ca 13 mm × 4 mm including 3 mm claw, orange-red, darker towards apex; keel half elliptic, falcate, auriculate, ca 12 mm × 5 mm including 2.5 mm claws, dark red towards apex, pink towards base. Stamens 10, free, ± uniform; anthers versatile, with a conspicuous connective, ca 1 mm long. Ovary shortly stipitate, fusiform, densely white-villous; ovules

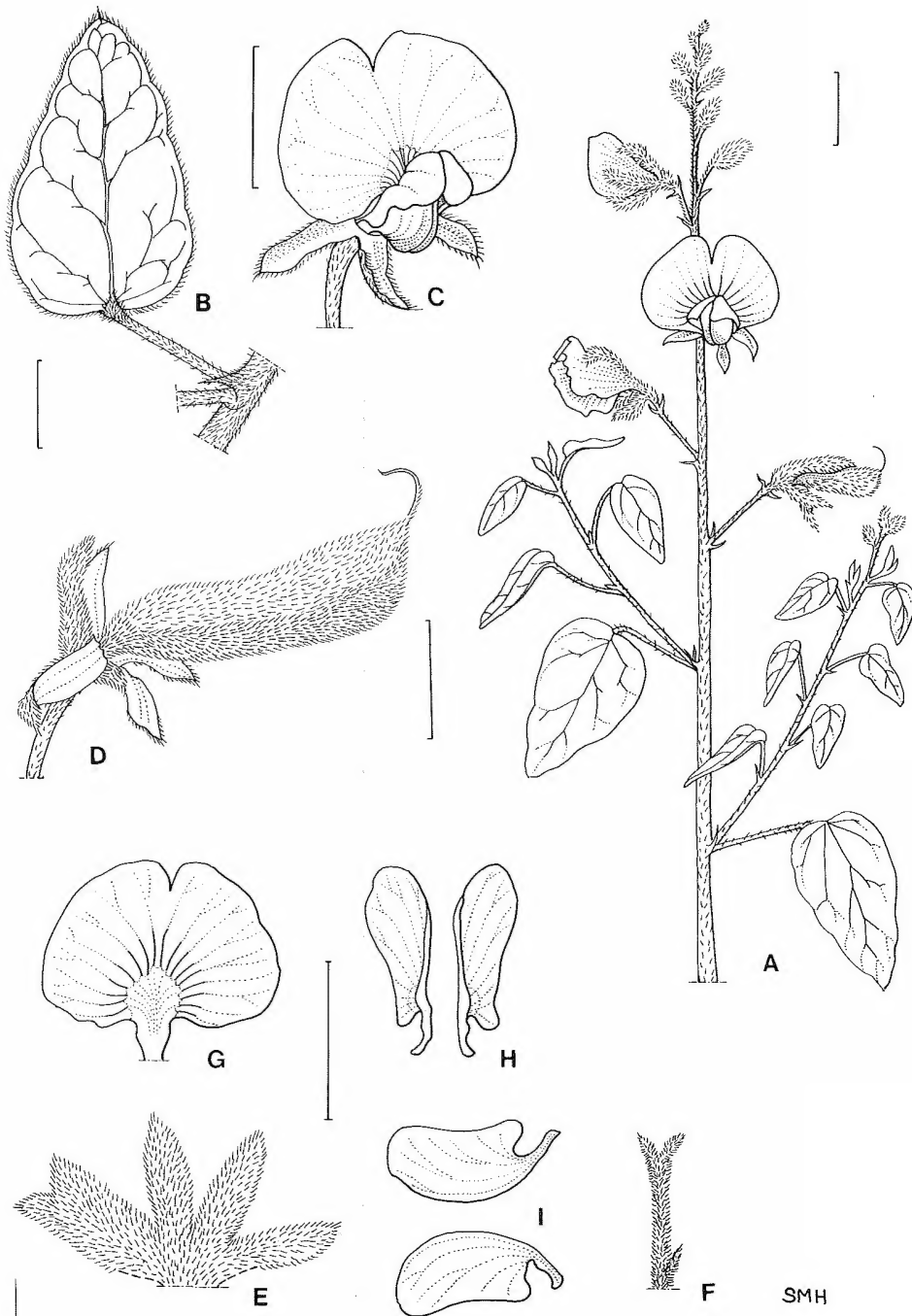


Fig. 1. *Isotropis foliosa*: A. flowering shoot. B. leaf, upper surface. C. flower. D. immature pod. E. calyx, opened out, upper lip at left. F. pedicel with bract and bracteoles. G. standard petal. H. wing petals. I. keel petals. All scale bars represent 1 cm. All from Crisp 7834 (the type).

numerous; style slender, incurved, lower half villous; stigma small, terminal. Immature pod obliquely narrow-obovoid, turgid, tapered at both ends, beaked with the persistent style, 15–25 mm × 4–6 mm (not including beak or stipe). Stipe *ca* 2 mm long; covered with fine, white, slightly spreading hairs. Seed not seen. **Fig. 1.**

Specimens examined. Queensland, MORETON DISTRICT: D'Aguilar Range, *ca* 13 km NE of Ipswich, between Kholo Creek and Wirrabara Road, 5 km E of Mt Crosby summit, 27°32'S, 152°32'E, Aug. 1986, *Crisp* 7834 & *Telford* (BRI,CBG, K), *Crisp* 7835 & 7836 (CBG); foothills of D'Aguilar Range, 4 km S of Mt Glorious, 27°21'S, 152°43'E, Sep. 1982, *Young* 611 (BRI; K,LE,MEXU,MO,NSW,SP *n.v.*).

Habitat: On foothill slopes vegetated by tall open eucalypt forest. At the type locality, the population is scattered over a steep west-facing midslope, on skeletal to very stony clay-loam. The dominant trees include *Eucalyptus maculata*, *E. microcorys*, *E. intermedia*, grey gums, ironbarks and *Lophostemon confertus*. The understorey is mostly dominated by *Imperata cylindrica*.

Affinities: *Isotropis foliosa* differs from all other species in the genus in its manifestly leafy appearance. To some extent, it resembles the central Australian *I. atropurpurea*, which has a comparable habit and similarly shaped leaves. However, *I. atropurpurea* differs in being conspicuously tomentose, rather thick in all its vegetative parts, and in having smaller flowers (8–10 mm long). There are four other species of *Isotropis* in Queensland: *I. filicaulis* Benth., *I. parviflora* Benth., *I. wheeleri* F.Muell. and *I. winneckeii* F.Muell. None has flowers more than 10 mm long and all have inconspicuous, narrow (mostly linear) leaves.

Conservation status: Endangered, coded 2E (criteria from Leigh *et al.* 1984). As this species is known from only two very small populations, it must be considered endangered. In the Mt Glorious area, it was 'recorded from only one very small area' (label of *Young* 611). At the type locality, the population consists of perhaps 50 plants. It is in State Forest, subject to management practices such as logging and prescribed burning. In fact, the site had been fired within the previous few months; fortunately, the plants of *I. foliosa* were sprouting from their rootstock. A Scout camp adjacent to the type locality puts additional pressure on the population. Cuttings have been taken with the intention of establishing the species at the Australian National Botanic Gardens.

Etymology: The specific epithet is Latin, meaning leafy. In *I. foliosa*, the leaves are larger and more obvious than in any other species of *Isotropis*, many of which have leaves reduced to phyllodes.

Key to Queensland species of *Isotropis*

1. Flowers 12–15 mm long. Leaves conspicuous, ovate, 10–23 mm broad.
South-eastern Qld..... ***I. foliosa***
 - Flowers 5–10 mm long. Leaves inconspicuous, linear or rarely narrow-elliptic, mostly less than 5 mm broad..... 2
2. Leaves not noticeably unifoliate; petiole 0–3 mm long. Plant tomentose.
Arid interior..... ***I. wheeleri***
 - Leaves noticeably unifoliate by an articulation near the petiole apex; petiole 2–10 mm long. Plant sericeous to glabrescent..... 3
3. Leaflet blade 6–10 mm long. Body of pod constricted near base. Arid interior..... ***I. winneckeii***
 - Leaflet blade 10–40 mm long. Pod tapered at base but not constricted above it. Near-coastal regions..... 4
4. Flowers subtended by bracts in longish (to 8 cm) open racemes. Central and south-eastern Qld ***I. filicaulis***
 - Flowers axillary or leaf-opposed. Gulf of Carpentaria..... ***I. parviflora***

Daviesia arthropoda in Queensland

Daviesia arthropoda F.Muell., Fragm. 8: 225 (1874). Type: In monte Olgae, *E.Giles* (holo: MEL).

This is a rare species of central Australian sand dunes. Until recently, it had been recorded only from the south-western corner of the Northern Territory, the immediately adjacent part of Western Australia and the Maralinga area in South Australia (Crisp 1981, Weber 1986). Now, an old unidentified collection by S.T. Blake from western Queensland has been located in the Queensland Herbarium. The material, which is in fruit, appears typical for *D. arthropoda* and comes from the usual sand dune habitat. This find is remarkable because it represents an extension of some 1000 km to the known range of what is still a rare plant.

Daviesia arthropoda is closely related to *D. ulicifolia*. For a key, descriptions and illustrations of these species, see Crisp (1981) or Weber (1986).

Queensland. GREGORY SOUTH/MITCHELL DISTRICT BOUNDARY: Between Retreat and Jundah, on low sandhill, Jul 1936, *Blake* 12071 (BRI).

Acknowledgements

I wish to thank Lloyd Bird for kindly providing detailed directions to the Kholo Creek locality. I am grateful to the Director of the Queensland Herbarium for the loan of specimens, and to Bill McDonald for drawing my attention to *Isotropis foliosa*. Thanks also to Susan House for preparing the illustration. The production of this manuscript was made possible by a grant from the Nell and Hermon Slade Trust.

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NOTES

***Paramignya* Wight (Rutaceae: Citreae) in Australia.**

Armstrong (1975) admitted *Paramignya trimera* (Oliver) Burkill to the Australian flora, stating that it was known 'only from the Montague Sound area of northern W.A.' He followed George & Kenneally (1975) who recorded it as new for the flora of Western Australia. Armstrong also noted the confusion about the taxonomic status of *Atalantia* in Australia. Burkill (1931) satisfactorily distinguished *Atalantia* from *Paramignya* on characters of the fruit, but fruits are not often available on herbarium specimens.

Notes and drawings at the Queensland Herbarium made by C. T. White at Kew in 1939 indicate that *Atalantia recurva* Benth. is conspecific with *Paramignya trimera*. The synonymy is:

***Paramignya trimera* (Oliver) Burkill, Gardens' Bull. 5: 212 (1931).**

Atalantia trimera Oliver, J. Proc. Linn. Soc., Bot. 5. suppl. 2: 23 (1861).

Atalantia recurva Benth., Fl. Austral. 1: 370 (1863).

Collectors have described the plant as a tree to 8 m, a shrub or a liane with greenish-yellow, cream or white fragrant flowers. It occurs in 'dry scrubs' (monsoon forest, deciduous vine thicket, semi-deciduous notophyll vine thicket) on coastal sands and, in Western Australia, on lateritised basalt. It ranges from the Kimberley region of Western Australia to Groote Eylandt. It has not been recorded from Queensland but can be expected on the west coast of Cape York Peninsula.

Specimens examined (all BRI). **Northern Territory.** Alyangula Beach, Groote Eylandt, Sep 1981, *Fosberg* 62185 & *Buckley*; Roper River, *Gulliver*; Wessel Island, 11°12'S, 136°42'E, Oct 1972, *Latz* 3433; Yirrkala, 12°12'S, 136°47'E, Aug 1948, *Specht* 992; west bank near mouth of West Alligator River, 12°15'S, 132°15'E, May 1978, *Webb & Tracey* 12327. **Western Australia.** Walsh Point-Port Warrender road, 14°36'S, 125°46'E, May 1981, *Tracey* 15081 & 15190; near Crusher Pool, Mitchell Plateau, 14°53'S, 125°46'E, May 1981, *Tracey* 15226; between Port Warrender & Mitchell Plateau, 14°35'S, 125°43'E, *Tracey* 15020; Cape Laveque, 16°25'S, 122°55'E, Jul 1973, *Gill* comm. *Webb & Tracey* 13143.

ARMSTRONG, J.A. (1975). The family Rutaceae in Australia. *Australian Plants* 8: 215-236.

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GEORGE, A.S. & KENNEALLY, K.F. (1975). The flora of Prince Regent Reserve, north-western Kimberley, Western Australia. *Wildlife Research Bulletin* (Western Australia). No.3: 31-68.

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BOOK REVIEW

THE EUROPEAN GARDEN FLORA. Volume 1. Edited by S.M. Walters *et al.* pp. 430 & xv. Cambridge: Cambridge University Press. 1986.

This is the second volume of the *Flora* to be published. The first (Volume 2) which covers the remainder of the monocotyledons was published in 1984. The *Flora* attempts to provide a scientifically accurate and up-to-date means for the identification of plants cultivated for amenity in Europe and promises to be a worthy complement to *Flora Europaea*. Comparisons with *Flora Europaea* are inevitable as the two are similar in many ways. As well as having the same publisher it has an editorial committee of a dozen well known British botanists with seven equally well known advisers from seven countries of continental Europe. A bias towards plants grown in the British Isles might be expected as all but one of the 33 contributors to this volume are based there.

The *Flora* has been well planned. The aims of the work and its format are discussed in some detail in four introductory pages. Families and higher groups are arranged in the Engler and Prantl system as expressed in Melchior (edition 12). Other more modern systems are available but since the Engler and Prantl system has been so widely used, compatibility with other works is assured. All taxa are fully described except for some that are closely allied to described ones. A shorter diagnostic description is given for these. Keys to families, genera and species are provided. As well as the formal keys an 'informal' key is given for most large groups of species. These are in fact multiaccess keys and are useful in identifying infertile material. The contributor of each genus is acknowledged. The sequence of species within genera appears to be at the whim of the contributor. In *Juniperus* (contributor: H.J. Welch) the 19 species are arranged in the order they appear in the key. On the other hand the 18 species of *Yucca* (J. Cullen) key out in the following sequence: 18, 16, 12, 17, 8, 9, 10, 2, 15, 1, 4, 14, 2, 3, 6, 5. The species are not arranged alphabetically. Perhaps the editorial committee could look at this point in future volumes. Of particular value are the references to taxonomic books and articles cited for each genus and family. Some of the lists are quite long. For example, for *Galanthus* there are 11 references covering the period 1894 to 1982. Authors of all names of taxa at and below genus level are given. The problem of abbreviating authors' names has been recognised and neatly solved. Instead of following the *Draft index of author abbreviations compiled at... Kew* with all its quirks, as has been done in the *Flora of Australia*, the editors have given authors' surnames in full without initials. Exceptions are some common names such as Brown, Foster and Smith. I wonder why there are so many botanical Smiths and so few Joneses. The need to simplify author citation has also resulted in the omission of those awkward and useless *exs* and *ins*. Instead of, for example, (Lindley in Mitchell) F. Muell ex Benth. we get (Lindley) Benth. The practice is in accordance with the International Code of Botanical Nomenclature and might be adopted with profit by editors and authors generally. Synonyms and misapplied names are given with the accepted name. Because of the difficulties of providing vernacular names in all the necessary languages they are not included. It could be argued that, since the text is in English, vernacular names in English could have been provided. Illustrations in the *Flora* are limited to clear line drawings emphasising characters useful in identification and to silhouettes of fern fronds. There are some good diagrammatic illustrations in the glossary. References to good published illustrations are also given. Many of these are to publications, such as Botanical Magazine and Botanical Register, not readily available in Australian libraries. For Australian genera such as *Eustrephus*, *Geitonoplesium* and *Anigozanthos*, however, references are made to modern Australian works. The book is remarkably free from errors, but among the Australian references I found C.A. Gardner's name spelt wrongly.

The design of the book bears comment. As in *Flora Europaea* the volumes are large with pages 275 mm × 220 mm. The typeface is neat and the text is easy to read, possibly because of the sparing use of italics and bold face. The introductory text is arranged in two columns, right hand justified. The effect is pleasing. The main body of the text, however, is arranged in three columns, not right-hand justified with ragged edges. The effect is not pleasing at all.

So much for the content and layout of the volume. Does it work? In south-eastern Queensland where one of the more aggressive weeds of gardens is *Nephrolepis exaltata* which is given a *Flora* hardiness rating G1 ('needs a cool glasshouse even in southern Europe'), finding plants to test keys and descriptions is difficult. Ferns are the exception. Many species are grown in glasshouse in Europe and out of doors here. They can be identified from the *Flora* without much difficulty. The illustrations are a great help. Delving into other families, Iridaceae, Agavaceae and Cupressaceae, proved equally rewarding. It is surprising that *Callitris* is not cultivated in European gardens. *C. monticola*, and, perhaps, *C. baileyi* and *C. oblonga* would make good tub plants in cool glasshouses in southern Europe.

The European Garden Flora is a well presented, easy to use, scholarly work highly recommended to serious horticulturalists particularly in temperate regions. Two volumes have been published and another three or four will probably be needed to treat the dicotyledons. The work may therefore prove rather too expensive for most people. What is urgently needed is a work similar to L.H. Bailey's *Manual of Cultivated Plants*, still a most useful volume though last revised more than 35 years ago.

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CORRIGENDUM

Austrobaileya 2(3) (1986)

p203. latin diagnosis. The third line should read '.....in vel
sub inflorescentia dispositis deficientibus et fructu

p205. Line 23 should be altered to read '..... petals twice the
number of calyx lobes, glabrous, white, inserted in a single whorl at the mouth of the
floral tube, narrowly clavate

Line 31 should read '.....sculptured, 60–65 µm diameter;

Line 48 should read '..... Clarkson 4584 (A,BRI,CANB,DNA,F,K,L,MEL

p249, p251. The line drawings on these pages have been reversed. The caption on p249
refers to the line drawing on p251 while the caption on p251 refers to the line drawing
on p249.

p276. Line 11 should read '..... Clarkson 4989 (BRI,CANB,DNA,L, MO,PERTH,
QRS,SAN);

The second part of Couplet 4 should read 'Ovules 6 or more

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For style and layout the most recent number of *Austrobaileya* should be followed; in particular the use of subheadings for distribution, etymology, etc.

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Tables should be as simple as possible. Long and/or complicated tables should be avoided. The tables should be numbered consecutively and each should be cited in the text.

Titles of journals cited in the text should be abbreviated according to *Botanico-Periodicum-Huntianum* (Hunt Botanical Library, 1968) while names of books should be abbreviated in accordance with F.A. Stafleu and R.S. Cowan, *Taxonomic Literature*, edn 2 (W. Junk, 1976-). In bibliographies the titles of both journals and books should be given in full. The author should check to ensure that all entries in the bibliography are referred to in the text and all references to papers or books in the text are entered in the bibliography.

Use author abbreviations as listed in *Draft Index of Author Abbreviations compiled at the Herbarium, Royal Botanic Gardens, Kew* (HMSO, 1980).

CONTENTS

	Page
<i>The Genus Pseuduvaria</i> Miq. (Annonaceae) in Australia L.W. Jessup	307
<i>Racosperma deltoideum</i> (Cunn. ex G.Don) Pedley (Leguminosae: Mimosoideae) and related species in northern Australia L. Pedley	314
Notes on <i>Racosperma</i> Martius (Leguminosae: Mimosoideae), 1 L. Pedley	321
Notes on Sapindaceae, V S.T. Reynolds	328
Two new species of <i>Notelaea</i> Vent. (Oleaceae) from south-eastern Queensland G.P. Guymer	339
<i>Racosperma</i> Martius (Leguminosae: Mimosoideae) in Queensland: a checklist L. Pedley	344
<i>Racosperma</i> Martius (Leguminosae: Mimosoideae) in New Zealand: a checklist L. Pedley	358
Rediscovery and status of <i>Adiantum whitei</i> Bailey (Adiantaceae) P.D. Bostock	360
Revision of the Australian Vitaceae, 2. <i>Cayratia</i> Juss. B.R. Jackes	365
Annotated checklist of Queensland Hepaticae J. Windolf	380
Studies on the Australian Asclepiadaceae, II. A new combination in <i>Gymnema</i> R.Br. P.I. Forster	401
Three new species of <i>Bonamia</i> Thouars (Convolvulaceae) from Central Australia R.W. Johnson	405
Two new species of <i>Convolvulus</i> L. (Convolvulaceae) from South Australia R.W. Johnson	408
A new species of <i>Isotropis</i> Benth. and a new record of <i>Daviesia</i> Smith (Fabaceae: Mirbelieae) from Queensland M.D. Crisp	412
NOTES	
<i>Paramignya</i> Wight (Rutaceae: Citreae) in Australia L. Pedley	416
Book Review	417
Corrigendum	418

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